American Artisan

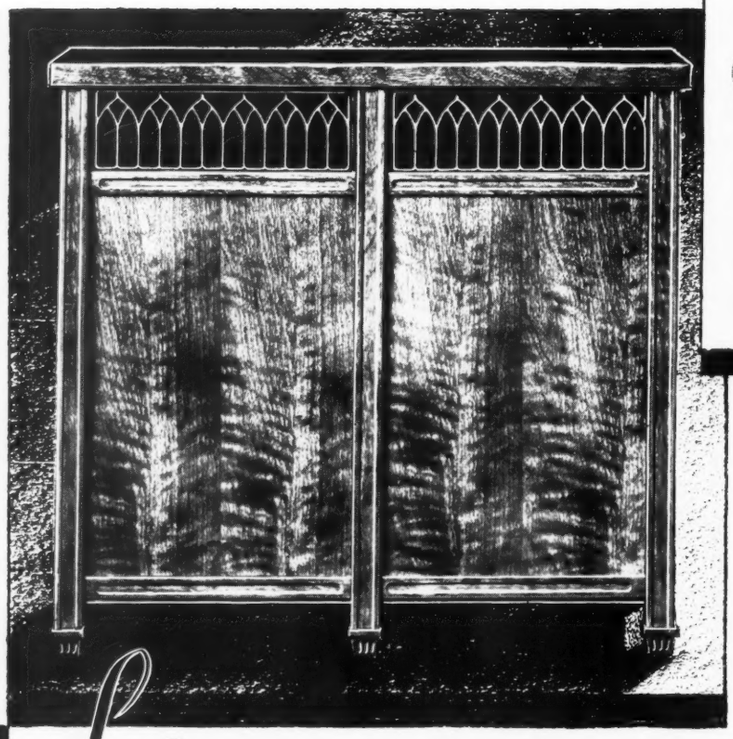
THE WARM AIR HEATING AND SHEET METAL JOURNAL

FOUNDED 1880

This beautiful church is roofed with that newest material—aluminum. Complete details of the job are in this issue.

MAY 24, 1930

TUNE IN WARMTH!



In modern homes and offices, there's always a place for a useful, good looking piece of furniture!

Payne

Looks LIKE A RADIO

But this Beautiful Console "Brings in" Balmy Heat!

One reason why most people postpone the purchase of home and office heating equipment until Winter is well along, is that ordinary old-style gas heaters are awkward and ugly, besides taking up much needed space.

The New Payne Console has changed all that! Here is a warm air circulating, cabinet-type heater of extraordinary beauty... and practical *all-season* utility as well!

Outwardly, the new Payne Console resembles a high-grade radio. It fits close to the wall, occupying no more space than a sectional bookcase. It heats every nook and corner, yet top and sides remain cool to the touch *always*...no more scorched walls or rugs...no burned fingers for tiny tots at play! Vent carries off burned fumes. Recirculates warm air without causing cold drafts on floor!

The smooth, flat top of the Payne Console affords an ideal spot for book ends, table lamp, flower bowl or bric-a-brac, yet fresh, pure warmth is available instantly...merely by turning on a valve!

There is still time to order your Summer and Fall requirements. Literature giving complete information and prices, will be sent to you, gladly.

PAYNE *Console* HEATER

MANUFACTURED ONLY BY THE PAYNE FURNACE & SUPPLY CO., INC., BEVERLY HILLS CALIFORNIA

We Consider Helping Weir Dealers Sell the

The Original Steel Furnace Now In Its Forty-Eighth Year

WEIR

Made by The Founders of the Steel Furnace Industry

To Their Customers Quite as Much Our Job as Selling to the Dealers Themselves

Our "dealer helps" actually HELP —and are designed to create more business for both our dealers and ourselves.

We fully appreciate the fact that no dealer will buy more furnaces until those he has are gone—or going. So we help him.

If You Believe You'd Like to Work with Such an Organization as Is Indicated Above, Just Drop a Line to

The MEYER FURNACE Co.
Peoria-Illinois

Published Every Other Week by Porter, Spofford, Langtry Corp., 139 North Clark Street, Chicago, Illinois. AMERICAN ARTISAN—the Warm Air Heating and Sheet Metal Journal—entered as second class matter, January 29, 1930, at the Post Office at Chicago, Illinois, under the act of March 3, 1879. Formerly entered on June 25, 1887, as American Artisan and Hardware Record.

INDEX PAGES—12 and 56 **[VOL. 99, NO. 11—$2.00 PER YEAR]** **BUYERS' DIRECTORY—52 and 54**

5 WAYS TO MAKE MORE FURNACE PROFITS

THE A. B. C's OF THE FURNACE BUSINESS

1. Develop Prospects

2 *Sell a Good Furnace*

3 *Surpass Competition*

4 *Cut Installation Costs*

5 *Keep Them Satisfied*

WHEN new home building falls off, the wide awake dealer looks to the replacement field for increased business. There are several ways to find replacement prospects. Some NIAGARA dealers employ women for house-to-house calls on a commission basis, because they can readily interest housewives. One NIAGARA dealer offers his customers $2.50 for every prospect they turn over to him, who buys a furnace. Another dealer canvasses the houses in his town that are at least 7 years old, because he has found most of them are good prospects for repairs or a new furnace.

OF course, cultivating contractors and building supply dealers is important—but perhaps there are architects in your community. Do they know of you and your furnace? See to it that everybody who influences the builder, the actual home owner, knows you.

IF you are a NIAGARA dealer, you have more to tell when you find a prospect. You represent a furnace that has a reputation, a prestige, a furnace most people know to be better than the ordinary. The NIAGARA is very economical, easy to operate. It has a large humidifier, can have forced circulation if desired, is adaptable for burning either gas or oil. You have many advantages as a NIAGARA dealer. Write for dealer proposition.

The Forest City Walworth Run Foundries Co., Cleveland, Ohio

NIAGARA

WARM AIR HEATING SYSTEMS

When writing mention AMERICAN ARTISAN—Thank you!

EASIEST TO BUY

NEW HOME

REPLACEMENT

AGAINST COMPETITION

For new house—replacement—large mansion—small cottage—oil burning—coal burning—against competition—Sunbeam Furnaces are easiest to sell!

With quality and price, both—they have every advantage that appeals to home owner and home builder, alike. Time payment terms to suit prospective buyers—a miniature aluminum furnace for retail salesmen—selling portfolios, booklets, folders, newspaper ads, movie slides, letters, post cards, broadsides, window trims, outdoor signs—everything to make your efforts more effective and productive, is available.

Everything that makes a furnace easier to sell—that will appeal to every class of prospective buyer, is included in the Sunbeam Dealer Proposition. This is why more Sunbeams were sold by dealers last year than any other make of furnace.

The reasons that make Sunbeams easiest to sell are the reasons why they are easiest to buy. Because of its vast resources and its close study of the retail end of the heating business, the Sunbeam organization has been able to anticipate the needs of the heating contractor; to know in advance the common objections which are raised by prospects. And Sunbeam has successfully eliminated the disadvantages which keep him from obtaining his full quota of profitable furnace sales.

If you will return the coupon below, complete information on the reasons why we believe Sunbeams are easiest to sell and buy will be sent to you promptly.

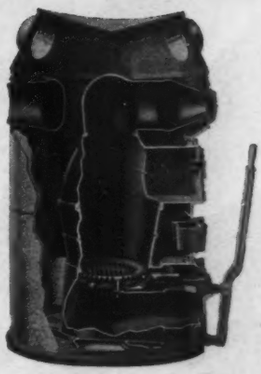
A Furnace for Every Requirement
Quality and Price—Both

The FOX FURNACE COMPANY ~ ELYRIA, O.

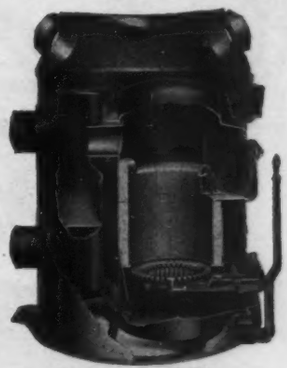
A Division of American Radiator and Standard Sanitary Corporation

SUNBEAM
WARM-AIR FURNACES

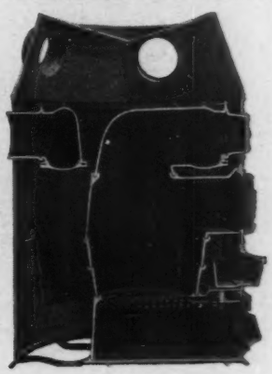
EASIEST TO SELL



1000 Series Sunbeam



Sunbeam Steel Furnace



C Series Sunbeam

Please send the 1930 Sunbeam Selling Program and prices. Include also a copy of your valuable 40-page Heating Manual.

NAME .....

ADDRESS .....

CITY AND STATE .....

A-6

Mention AMERICAN ARTISAN in your reply—Thank you!

WHO WILL TEACH THEM?

SOMEONE is sooner or later going to tell these owners of smoking chimneys about coal that goes up in smoke. A lot of new installations will be made. Why shouldn't YOU teach them this simple lesson and get these jobs for *yourself?* You've got the best solution to the problem—the R & B Super-Smokeless Warm Air Heater with the patented air inlet just above the combustion chamber. Works just like an automobile carburetor—they'll see your point in a moment. Someone is surely going to hit the smoke trail for new business—and no one can do it more successfully than YOU!

We believe in and are members of The National Warm Air Heating Association.

RICHARDSON & BOYNTON CO.

Heating and Cooking Apparatus Since 1837

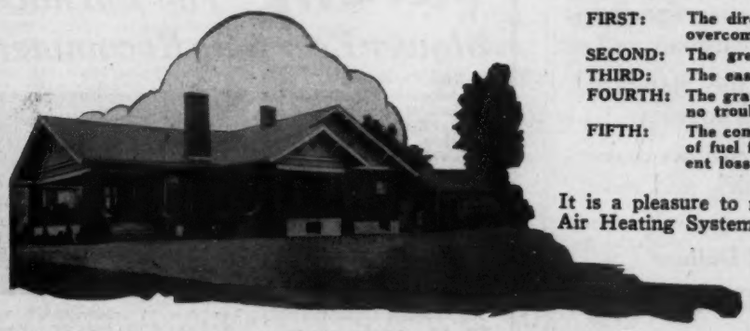
260 Fifth Ave., New York **Utica, N. Y.**

BROOKLYN NEWARK CINCINNATI BUFFALO PORT CHESTER MINNEAPOLIS PHILADELPHIA DETROIT CLEVELAND PROVIDENCE BOSTON CHICAGO

What I Think of Premier—

NOTE: Premier users are Satisfied users. They tell their friends—and that is another reason why Premier Dealers sell more furnaces with less effort than their competitors. It is worth your while to get complete details of the Premier Agency TODAY.

Residence of
Mr. Frank L. Morgan
Dayton, Ohio



By MR. FRANK L. MORGAN
A Premier User of
DAYTON, OHIO

Premier of Dowagiac,
Dowagiac, Michigan.

Gentlemen: The Premier Furnace installed in my home has been most satisfactory. In the many years that I have followed building Better Homes, I have had a varied experience with heaters.

The Premier, in my judgment, is the most modern, up-to-date and economical warm air heater on the market today.

In its construction it overcomes many weak points in other good furnaces, namely:

FIRST:	The direct draft damper in the radiator overcomes smoke in the cellar.
SECOND:	The great amount of radiating surface.
THIRD:	The ease of operation.
FOURTH:	The grate shaking and dumping features; no trouble to keep the firepot clean.
FIFTH:	The consumption of such a small amount of fuel for the desired results, no apparent loss whatsoever.

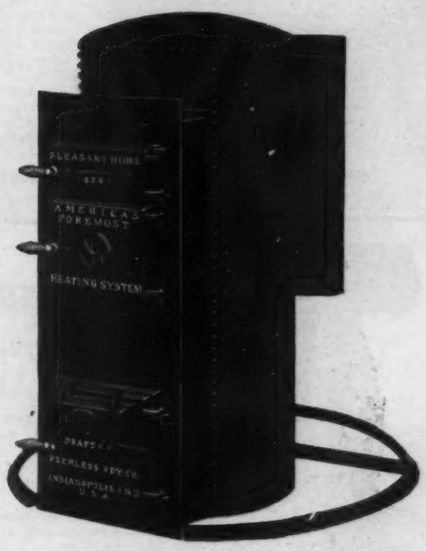
It is a pleasure to recommend the Premier Warm Air Heating System. Respectfully yours,

Frank L. Morgan

A *quality steel furnace at a Low Price?*
YES!

SOME folks can't be sold the best but when you can't sell them a PEERLESS steel furnace you can still offer them a high grade steel furnace at a lower price. The PLEASANT HOME is not as good as a PEERLESS of course but it is a high quality product. We would not recommend it unless it was. It's not the least expensive steel furnace on the market—its quality is much too good.

Both you and your customers will find it a greater value than you expect at this low price.



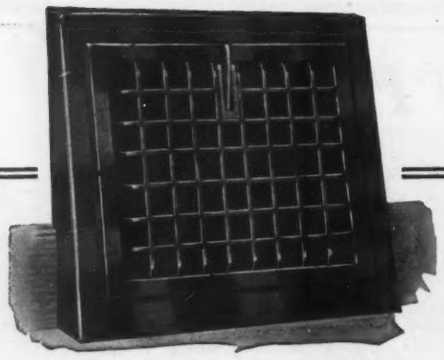
Let us send you full details and prices NOW

THE PEERLESS FOUNDRY COMPANY

Bailey-Farrel Mfg. Co.,
Warehouse Distributors
at Pittsburgh, Pa.

INDIANAPOLIS, IND.

Warehouse,
Youngstown, Ohio



The AUERISTOCRAT

of all registers, combining air capacity, decorative and concealing features.

Designed to conform with the Standard Code so they fit all standard boxes.

Auer Patented mechanical features make it perfect in operation,—quick and easy to install.

Auer's Save Hours and Dollars

The AUER REGISTER CO.
Cleveland, Ohio

WATERBURY SEAMLESS FURNACE
REG. U.S. PAT. OFF. PIPE OR PIPELESS

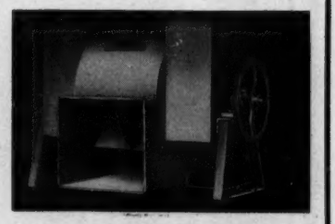
The Leader of All-Steel Heating Systems

The Waterman-Waterbury Co.
1122 Jackson Street N. E.
Minneapolis, Minn.

Furblo ***The Furnace Blower Everyone Recommends***

MANUFACTURERS have adopted FURBLO as standard equipment — jobbers catalog FURBLO exclusively —dealers everywhere find FURBLO the one and only satisfactory solution to the problem of mechanical warm air heating.

FURBLO is not a fan—but a blower. Quiet, efficient, powerful, sturdy, dependable. Guaranteed to always produce on even the hardest job.



Two sizes fit practically all installations. Send for complete information.

Lakeside Company
Dept. A5 Hermansville, Mich.
Makers of Lakeside Ventilating Equipment

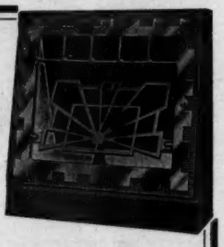
LENNOX TORRID ZONE STEEL FURNACES

An Emblem of Quality

The dealer who has never sold Torrid Zone steel furnaces has no conception of the many advantages this furnace line offers. To say you are familiar with Torrid Zone construction is not enough. There are, free engineering service, newspaper and dealer help advertising, financial aid, an unusual variety of furnace sizes, quick deliveries made possible by large warehouse stocks, and a score of other Torrid Zone service features of vital interest to every furnace dealer. Why not investigate for yourself Torrid Zone possibilities. Write for complete information on the Torrid Zone line.

LENNOX FURNACE COMPANY, INC.
Marshalltown, Iowa Syracuse, N. Y. Toronto Winnipeg

Our customers tell us that this register doesn't streak the walls and that it is quickly installed.



ALL THIS AND MORE, AT NO GREATER COST

"It's different from all the rest"

SYMONDS REGISTER COMPANY
3117-23 Minnesota Ave. St. Louis, Mo.

GILTEDGE ***guaranteed***

FURNACES

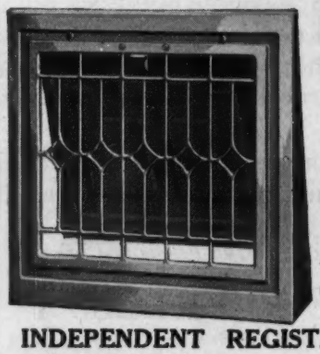
FOR fifty-five years the name GiltEdge has meant high quality furnaces. Today more than ever before GiltEdge Furnaces lead as to quality and workmanship.

The GiltEdge agency will add extra prestige and profits to your business.

Write today for full details regarding the GiltEdge 1930 sales plan.

R. J. SCHWAB & SONS CO.
283 Clinton Street Milwaukee, Wis.

INDEPENDENT REGISTERS

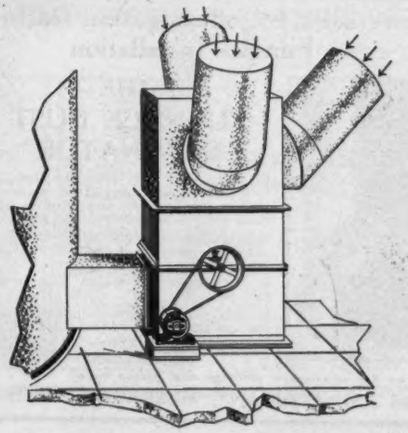


VENTILATORS
GRILLES

Any Size
Any Finish

Our new catalogue will interest you. May we send you a copy?

INDEPENDENT REGISTER & MFG. CO.
3747 East 93rd Street ~ ~ Cleveland, Ohio



Air can enter at top, rear or bottom because of special design.

The air chamber in back of scroll or blower housing is an exclusive feature. This design allows unrestricted entry of free air from top, sides and bottom of inlets and provides increased and better distribution of air. It increases capacity of blower.

To positively move the air---
To be sure of uniform air delivery to all rooms---
To make better profits---

USE THE

AM-PE-CO

ROTARY BLOWER

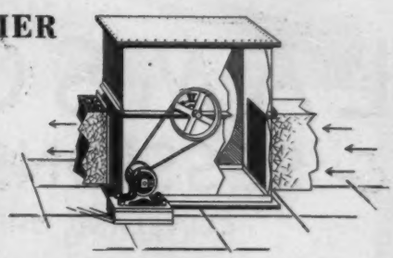
THIS blower was designed for use exclusively on warm air heating systems. It furnishes efficient mechanical circulation and is practically noiseless.

SELL IT FOR COOLING HOMES THIS SUMMER

Cooling the home with the Am-Pe'-Co is a fact—this positive blower enables you to guarantee REAL air circulation—enables you to get extra business and profits right now.

The Am-Pe'-Co is Silent—almost noiseless—and perfect in construction, being made by a Company thoroughly experienced in making precision products.

Write today for full details and prices.



AMERICAN MACHINE PRODUCTS COMPANY
MARSHALLTOWN, IOWA

Vernois

FURNACES
ENAMELLED CABINET CIRCULATORS
ENAMELLED GAS RANGES

Write for complete catalog

MT. VERNON FURNACE & MFG. CO.
Mt. Vernon, Ill.

All types and sizes for all house heating needs.

MONCRIEF

THE SERIES "C"

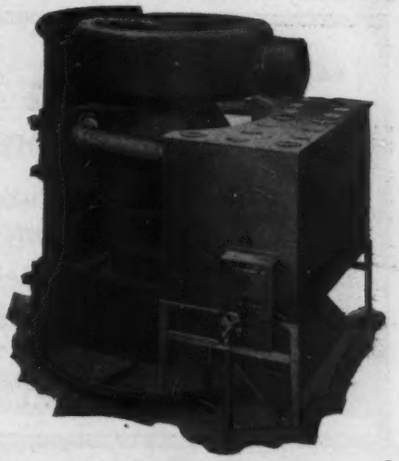
FURNACES

The Henry Furnace & Foundry Co.
3471 East 49th Street
Cleveland, Ohio

THE NEW MONCRIEF STEEL FURNACE

IF FOLKS WANT TO HEAT WITH GAS—

Here's the unit to sell



The MUNKEL GAS ATTACHMENT

(Fits Any Coal Furnace)

THERE are many advantages of selling new customers Munkel Gas Heating. The desirable cleanliness of gas fuel—the use of the furnace for burning rubbish, etc.—the extra heating surface of the cast furnace (the Munkel Gas Attachment heats both units) and the choice of two fuels.

For old installations its a big business getter. Every furnace user is a LIVE prospect. Show them how they can have CLEAN GAS HEATING with the Munkel Gas Attachment and you'll make BIG PROFITS RIGHT NOW.

Write today for full details and prices

The MUNKEL-RIPPEL HEATING Co.
"31 Years of Service" COLUMBUS, OHIO

Ready to Use

Needs only Heat

EXACT

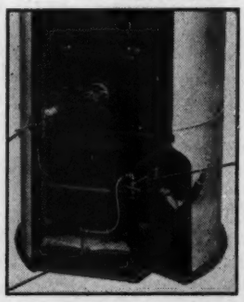
No more soldering failures—Kester eliminates the guesswork of separate fluxes. Simple, sure, self-fluxing operation will speed your work and save you money on every sheet metal job. Use Kester Acid-Core Solder for shop-work. It is made in many gauges. Write for samples of the new Kester Body Solders.

FROM ALL JOBBERS

KESTER SOLDER COMPANY
4241 Wrightwood Ave. Chicago, Illinois
Incorporated 1899—Formerly Chicago Solder Co.

KESTER FLUX-CORE SOLDER
ACID-CORE ROSIN-CORE PASTE-CORE
METAL MENDER RADIO SOLDER

Make more sales by offering this feature on every Furnace Installation



THE FURNACE DUST ELIMINATOR

IT keeps dust from spreading throughout the house—makes ash removing a clean job—makes furnace more efficient and prevents burnt out grates.

Your customers despise the dirty job of removing ashes—this feature will appeal to them.

It costs little but makes more profitable sales for you.

It is a new exclusive patented feature you can adopt for your line of furnaces. Easily attached on the water connection and ash pit door.

Write for illustrated circular and prices today

DUSTLESS ASH COMPANY, MUSKEGON, MICH.

LAMSON & SESSIONS CO.

CLEVELAND, OHIO

Plants at Cleveland and Kent, Ohio; Chicago and Birmingham

A New Furnace Paste

LARCO MINERAL PASTE

Non-Cereal Non-Souring Keeps after Mixed

For Better, Neater, Quicker Work

Asbestos Paper does not absorb as much Larco Mineral Paste as it does cereal pastes. Paper does not become soggy—not so apt to tear.

Larco Mineral Paste does not turn brown—no stains—mice will not touch it either when moist or dry and it does not gum up the hands.

Larco Paste can be kept on hand mixed ready for use as it does not sour. It has greater covering qualities.

It slips easily but adheres permanently.

Write for circular which tells all about it—get Larco prices.

LARSEN-BENNETT COMPANY
Omaha, Nebraska

"American Seal"

FURNACE CEMENT

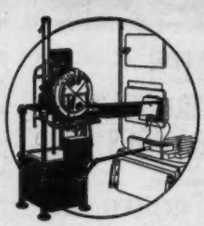
Roof Cement—Stove Putty
Plumbers Putty

PAINTS AND SPECIALTIES

WILLIAM CONNORS PAINT MFG. CO.
Established 1852
TROY NEW YORK

JAMES L. PERKINS, Western Distributor
140 South Dearborn Street, Chicago, Illinois

Here's Your Big Opportunity to MAKE MORE MONEY in 1930!



Find out about *"balanced heat"*—the McIlvaine Method of oil heating, approved and recommended by leading Warm Air Heating Experts. The McIlvaine Continuous Flame Oil Burner, with the five flame sizes, automatically balanced to the heat demand, listed as Standard by the Underwriters Laboratories, and Approved by the New York Board of Standards and Appeals, gives exceptionally satisfactory results and is highly efficient when installed in Warm Air Heating Systems.

Write Now—for Dealers' Proposition, Sales Plans and Complete Information

McILVAINE BURNER CORPORATION
747 Custer Ave. Dept. A Evanston, Illinois

DETROIT-CLEVELAND-BUFFALO

THE J.M.&L.A. OSBORN CO

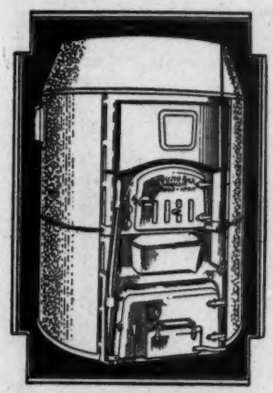
EVERYTHING USED IN SHEET METAL WORK

ASK FOR CATALOGUE OR PRICES

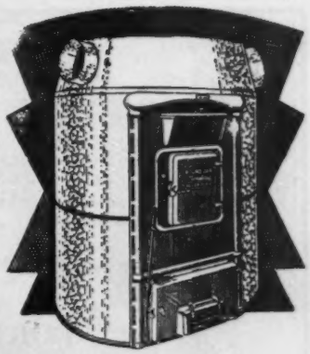
The "Torrid" Furnace is designed to give a tremendous amount of heat, much more than that furnished by the ordinary tinner's furnace.

A fuel saver and generating machine of the finest quality made at the price.

GEO. W. DIENER MFG. CO.
404 North Monticello Ave. Chicago



ROUND OAK FURNACES



MOISTAIR BLENDED-IRON **MOISTAIR BOILER-PLATE**

Quality—Service—Satisfaction

Write for details regarding Agency

THE BECKWITH CO., Dowagiac, Michigan ***Established 1871***

Try One For Three Days FREE

Our one-man outfit makes low overhead

REPORTS from Super Suction owners bring out these big facts: nearly three-quarters of all furnaces cleaned buy repairs—many order complete overhauling—prospects for new furnaces are constantly turned up—and sold.

For every worker out cleaning furnaces four shopmen are kept busy on the new business created. What would that mean for your own shop?

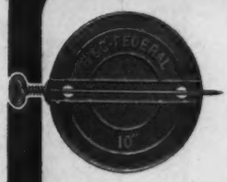
You can have a Super Suction Cleaner for three days' free trial. Can you afford to pass up this big opportunity? Write today.

THE NATIONAL SUPER SERVICE CO.
1944 North 13th Street Toledo, Ohio

DAMPERS *and* Damper CLIPS *and* TIPS

—from the H & C-Federal "quality-built" line of furnace accessories.

ATTRACTIVELY PRICED



H & C-FEDERAL
Warm Air Dampers

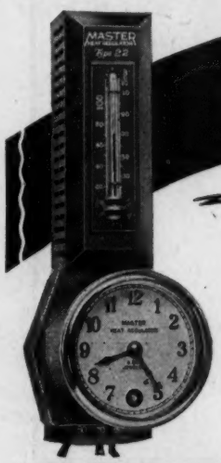
Sturdy, well made. Handle enters either side of disc. Made in 6", 7", 8", 8½", 9", 10", 12", 14" sizes.

H & C-FEDERAL
No-Rivet CLIPS and TIPS

Made of heavy gauge material. Punched with rivet holes, but can be fastened without rivets by prongs provided.

See your jobber or write for prices and catalog showing full line of furnace accessories.

HART & COOLEY MFG. CO.
Successors to Federal Mfg. Co.
61 WEST KINZIE ST., CHICAGO, ILL.
Factory at Holland, Michigan



MASTER HEAT REGULATOR

Type 22

FULL ELECTRIC

No Daily Attention
8-Day Jewelled Clock
Close Regulation—1° or Less
Clock Model, $80. Plain Model, $55

Write for Details and Dealer's Discounts

WHITE MFG. CO.
2362 University Ave., St. Paul, Minn.

---

only **$48** ***installed***

dealer price $22.75

"SheerComfort" Heat Regulator gives all electric and fully automatic control over the draft and damper doors of home heating plants. Four exclusive safety features found in no other heat regulator at any price—yet costs less than any other electric regulator on the market. Ask your jobber or write H. M. Sheer Co., 213 Hampshire St., Quincy, Ill.

SHEER COMFORT

heat Regulator

Founded 1880

American Artisan

THE WARM AIR HEATING AND SHEET METAL JOURNAL

Entered as second class matter, January 29, 1930, at the Post Office at Chicago, Ill., under act of March 3, 1879. Formerly entered on June 25, 1887, as American Artisan and Hardware Record.

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United States $2.00
Canada $3.00
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Fred D. Porter, *President* John C. Langtry, *Vice-President* Howard H. Bede, *Secretary*
Editor: Joseph D. Wilder *Business Manager:* Etta Cohn
Circulation Manager: John R. Hannon

Advertising Representatives:
Charles E. Kennedy — J. F. Johnson

New York Office: 295 Madison Avenue, Room 1109, *Tel. Ashland 5342*
Frank G. Cambria, *Eastern Representative*

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THE WARM AIR HEATING AND SHEET METAL JOURNAL

Vol. 99 CHICAGO, MAY 24, 1930 No. 11

Pictures Tell the Story

EVER since we began to visit the shops and offices of the men in the furnace and sheet metal trades, we have been impressed by the seeming lack of interest in pictures.

We're not talking about paintings in art galleries, nor about the squawkies, but about photographs of the various jobs you have completed.

Of course it is easy to say, "What good are pictures? Customers are not interested in pictures, but in prices." But we believe that that idea is all wrong.

Just make a little test on yourself during the next few days. First take the salesmen who come into your office. They sit down and give you a sales talk about their line and you listen. Probably half your mind is on the problem of how to collect that forty dollars from Bill Jones.

But just let this same salesman bring out a leaflet full of pictures showing his product in action and you immediately perk up and the half of your mind that was wandering joins the active half and the salesman has put over his idea.

Or just keep this picture idea in mind for a few days while you are reading your papers and magazines. Take the ARTISAN as an example. In this issue there are some stories full of pictures. And there are others in which there is no picture.

Begin at the beginning and leaf through the pages. Which stories did you linger over longest? Why, the ones with the pictures, of course. The ones without pictures had to have a striking title before you even thought of getting into the serious matter of reading the information presented. Yet there was just as much meat in the pictureless articles as in the others.

The thing is—Pictures tell the story.

Now all this little experiment means that any customer you may be calling on is just as partial to pictures as you are. No man living can deny the appeal to the eye. He may shut his ears or lend you only one of them, but his eyes exert such a great pull that eye attention is undivided.

How can you capitalize on this fact? Just as scores of other industries have been doing. They sell you through pictures—you ought to sell through the same means.

Let's take up a typical sale as an example. You are calling on the prospect. You tell him all about warm air heating. You explain what warm air heat is. You explain such things as humidity, air circulation, automatic control, and what warm air heat is as compared with other kinds of heat. Through this part of the talk you probably make use of the booklets furnished by the manufacturer of your furnace.

Then you begin the story of how this desirable heating plant is to be put into the house. At this point, if you are a wise contractor, you get the customer's hat, load him into your car and take him out to see some of the jobs you have recently completed. Of course, if you are talking to the prospect at night this may not be so easy.

It would be just as impressive and just as good salesmanship to use pictures as to escort the prospect to the job. Suppose you had a folder of pictures showing several typical jobs you installed. There ought to be several kinds of installations; one could have a fan, one a fan and washer, humidifying and automatic control apparatus, perhaps a stoker or oil burner job, and so on.

By all means you ought to have pictures of flat and round pipe jobs so that you can easily explain the advantages of both systems of piping and illustrate your points. If you had a real honest-to-John picture book you would have pictures showing your workmen setting up the various pieces of the furnace and the accessories so that the prospect would have a very definite idea of what all the noise is about.

And to complete the job every good installation you make ought to contribute one or more pictures to your file. Every time you call on a prospect you ought to be able to show him the pictures of a job done right in his own neighborhood.

These same things apply to the sheet metal man. If you do metal roofing some pictures of typical jobs would help greatly to convince your prospect that you have the organization, the experience and skill to bid on and complete the kind of a job he is letting. If you are doing house metal work, a few pictures of good-looking houses on which galvanized iron, copper, lead or lead-coated copper was used, ought to give a complete picture of what you can do for him.

The Fourth Article On

Cost Accounting

THE third article in this series took up for discussion the routine incident to booking an order for a furnace and a general treatment of the procedure incidental to starting work of installation. Three forms were illustrated—the Material Ticket, the Time Card and the Cost Sheet. It is, I believe, well for us to thoroughly understand these three forms before proceeding further. In previous articles, you have, I hope, learned that your money is forever changing—today it is cash, tomorrow it is a bank balance, then it goes into material, labor and expenses. The big object of bookkeeping is to enable you, the proprietor, to know at all times, through the operation of your bookkeeping system, just where that money is.

Joseph G. Dingle, C. P. A.

You have sold John Smith a furnace, INSTALLED. Before making this sale you prepared your estimate of the cost. You may, or may not, have prepared this estimate according to the best practice in estimating. You may be one of those business men who *know* how much a job should cost without the bother of figuring it out item by item, piece by piece. If you are, you don't need to read further, for you perhaps know more about your business than you can use. This series of articles is written for those fellows who know from long practice and experience how to install furnaces correctly and scientifically, but who are willing to admit that there are many things they do not know about the executive end of their business. To these progressive Warm Air Furnace Installers THE AMERICAN ARTISAN and the writer are trying to bring a complete course of bookkeeping in language they can understand. We shall, then, proceed with our study on the theory that a proper estimate was prepared as a preliminary step in selling this furnace job. It might be well for you to pause here and review a previous article entitled "How Shall I Price My Estimates?" in the March 1st issue of the ARTISAN.

This article is the fourth of the series on bookkeeping and accounting. In the last issue we showed typical job tickets. In this article a job is used as an example and the items entered on the proper ticket.

The wheels begin to turn immediately we land John Smith's order. You were shown in the last article that materials and labor began to go out of your immediate possession and into John Smith's home. In that article you were shown the Material Ticket, the Time Card and the Cost Sheet. Let us now put some figures on those forms to drive home more forcibly the necessity for such records.

Your truck loaded up a furnace, a casing, some galvanized iron and a smoke pipe. All these articles were taken from your shop. Re-

MATERIAL TICKET

May 20 1930

CHARGE JOHN SMITH JOB WITH THE FOLLOWING MATERIALS:

PIECES	DESCRIPTION	POUNDS	PRICE	AMOUNT
1	furnace		135 00	135 00
1	Casing Less hood		8 75	8 75
	Galvanized Iron	100	12	12 00
1	Smoke Pipe			3 50
	Total			159 25
	POSTED 5/20			

APPROVED Joe Pearson SIGNED Arnold Gerding EMPLOYE

Your bookkeeper can't be sure of what materials have been taken to a job unless your men fill out the material ticket. Here is the ticket filled out for the John Smith job

member, if you will, that these articles represent money. You have, by loading these goods on your truck, taken them out of Material and Supplies accounts and put them into the Work In Process account for the John Smith job. Has the Material Ticket been made out, to inform the bookkeeper of this fact? To apply our rule of bookkeeping we must debit the disposition—Work In Process, Smith Job and credit Materials and Supplies with the cost of these goods.

Our entry will be originated on the Material Ticket, which will read as follows:

1 Furnace	$135.00
1 Smoke pipe	3.50
1 Casting, less hood	8.75
100 lbs. galvanized iron	12.00
Total	$159.25

Now, take a look at that material ticket and see just what it looks like. Arnold Gerding, the employe who checked the material out, has made up the Material Ticket, but left off the pricing which was done by the bookkeeper, or, possibly, by Joe Pearson when he approved the ticket. What does this ticket tell the bookkeeper? It says that Arnold Gerding checked out certain definite materials to the John Smith Job, and that the boss, Joe Pearson, has seen the ticket and approved it. What does the bookkeeper do with this approved material ticket? The first act of the bookkeeper is to see that the extensions are accurate and that the total is correct. The second step is to open a Cost Sheet for this John Smith Furnace Job, which we will call Job No. 1. After opening up this cost sheet, the bookkeeper will post this material ticket to that Cost Sheet. See the illustration and trace the postings the bookkeeper has made. You will find that on May 20th a furnace, a Casing, less hood, a smoke pipe and a quantity of galvanized iron, each item priced separately (at cost) just as is shown on the material ticket. You will observe that the total of this material ticket, $159.25, is carried over to the total column on the Cost Sheet. The third step for our bookkeeper is to place this material ticket in a suitable file where all

TIME CARD

EMPLOYE ARNOLD GERDING

WEEK ENDING MAY 24 1930

DAY	JOB	START	STOP	HOURS	RATE	AMOUNT
20	JOHN SMITH	8 00	12 00	4 00	1 25	5 00
20	H. BROWN	1 00	4 00	3 00	1 25	3 75
20	JOHN SMITH	4 00	5 00	1 00	1 25	1 25
	TOTAL					

The Time Card should show, by the week, just where each of your workmen spent his time. The totals must equal your pay roll and also equal your hours charged to each job

COST SHEET

JOHN SMITH JOB No. 1

DESCRIBE JOB

INSTALL FURNACE, AS PER ESTIMATE No 49

DATE	DESCRIPTION	POUNDS	PRICE	HOURS	MAT'L	LABOR	TOTAL
5 20	FURNACE		135 00		135 00		
	CASING LESS HOOD		8 75		8 75		
	GALV IRON	100	12		12 00		
	SMOKE PIPE		3 50		3 50		159 25
20	ARNOLD GERDING			5 00		4 25	163 50

From the material ticket your bookkeeper makes out a Cost Sheet. On this Cost Sheet the items from the Material Ticket are posted and totaled. Labor is also accounted for on this ticket

material tickets for the month will be accumulated, and, at the close of the month a recap of all these material tickets will be made to arrive at the total cost of all material and supplies delivered from the shop to jobs. This total will then be used as a basis for a journal entry to charge Work In Process and credit Materials and Supplies with the materials and supplies put into process during the month.

Now, to prove that our bookkeeper has done the work accurately we will make a recap or total of all material shown on our several cost sheets and compare that with the total of the material tickets. If they agree, all tickets have been posted correctly. In other words, Cost Sheet for John Smith Job shows $159.25 for materials and our Work In Process account at this point would show a balance of $159.25.

Having delivered that material to the Smith Job, we can now look to our time cards for labor charges. We find Arnold Gerding signed the Material Ticket, so we may expect to find him working on this job. Now, if you will look at the time card illustrated here you will find Arnold Gerding worked on this job from 8 a. m. until 12 noon. He worked on the Brown Job from 1 p. m. until 4 p. m., and then went back to Smith's job, where he worked from 4 p. m. to 5 p. m. This card, being a weekly card, would come in at the close of the week and would, of course, show just what Arnold Gerding had done during the week. For purpose of illustration, I am using just the one day's work. The card shows Arnold worked five hours on the Smith Job. The bookkeeper inserts the rate and shows the amounts opposite each item on the card. The total of this "Amount" column should equal the amount paid Arnold for that week. The next step for the bookkeeper is to turn to the Cost Sheets and post Arnold's labor to the proper jobs. We find (in two items) that he worked five hours on the Smith Job on the 20th, and we post on that Cost Sheet that data. Now look at the illustration of the Cost Sheet and you will find there that on May 20 Arnold Gerding worked five hours on that job, that the labor cost was $6.75 and that this sum, added to the material already posted, brings the cost of the job to date to $165.50. Other Cost Sheets will likewise be charged for labor items. Brown will be charged on his Cost Sheet with the three hours of Arnold's time. Having posted these labor items to the proper cost sheets, our bookkeeper will now check her work to see how much of the week's payroll is chargeable to Work in Process, how much is idle time or indirect labor. Her entry covering payroll will, of course, be a credit to the bank and charges to Work In Process and such other accounts as are required to account for idle time, indirect labor, etc.

Now, to sum up. We know, of course, that the John Smith Job is not yet complete, but we also know that we have put $165.50 of our money into that job as materials and direct labor. Our Cost Sheet shows that very plainly. We cannot lose sight of that fact. It is a matter of written record, and the routine procedure is established. The men do not take materials out of the shop without first making a written report thereof on Material Tickets. The men give us itemized records of their work so we can charge it to proper accounts. Let's just jump over the rest of the transactions required to complete this job. They will, in principle, be the same as those recorded above and will follow through without trouble.

The Smith furnace job is completed. Our Material and Labor Cost has been, say, $225. It is on the cost sheet, item by item, and we can compare our estimate with our written record of performance. We estimated labor to cost a certain amount and our cost sheet shows how much it ACTUALLY cost, who did the work and the dates on which it was done. Here you can check your estimate and, if off, correct for future use.

When the job is completed, we prepare an entry charging Cost of Sales with this $225 and credit Work In Process. This takes that $225 out of the Work In Process account and we are through with the Smith Job.

We also charge John Smith and credit sales with the sales price of this job. Say we sold it for $350, our records will show:

Sales	$350
Cost of sales (material and labor only)	225
Gross profit	$125

And out of this gross profit must come our OVERHEAD and our PROFIT AND LOSS.

The start of this job was your estimate. You ESTIMATED what it would cost and made your price accordingly. You landed the order at your price. Then you did the work and built up in accurate useable form the items actually entering into the cost of the work. You not only have available the actual cost of this job, but you have in comparable form your ESTIMATE or GUESS at what it would cost. By using these two sets of figures, your estimate and your actual cost, you can correct your estimating for future jobs. You know just what you are doing on each job.

We have covered Estimating, the Work In Process account, with the means of caring for your money as, in the shape of materials and labor, it flows out of your possession into the customer's job. We will in our next article take up a discussion of the Overhead Accounts and ultimately cover the entire chart of accounts, together with suitable journals for a complete set of books for the Warm Air Furnace Installer.

As this series of articles are published, we would like to have our readers feel free to ask questions or suggest points which might be elaborated upon. This series is intended to help readers keep better records, and by so doing become better and more successful business men.

Metal Branch, National Hardware Assn., Becomes National Association of Sheet Metal Distributers at 1930 Meeting

THE Clifton House, Niagara Falls, Ontario, Canada, was the scene of the Nineteenth Annual Meeting of the Metal Branch of the National Hardware Association of the United States.

From many angles it was probably the most helpful and constructive meeting held in many years. There was a happy and unselfish interchange of ideas which should be of great aid in bolstering faith in the future of business.

Probably the most surprising accomplishment of the meeting was the adoption of the motion to change the name of the association from the Metal Branch of the National Hardware Association of the United States to "The National Association of Sheet Metal Distributors." The report of the committee having the matter in hand was that the name Metal Branch was misleading and a name more in keeping with the objects and aims of the association be chosen. The matter was laid before the members and the name National Association of Sheet Metal Distributors adopted unanimously.

Heretofore the president of the National Hardware Association, in consultation with members of the Metal Branch, has appointed the chairmen of the Metal Branch. With the change in name, the new plan of the N. A. S. M. D. will be to elect its own officers. The personnel will consist of a President and Vice-President to be elected for one year or until successors are chosen. An Executive Committee of six will be elected, two members of the committee to be elected for one year; two for two years; two for three years, successors to be elected at the close of their terms for a term of three years. The secretary and assistant secretary of the National Hardware Association will continue to serve "The National Association of Sheet Metal Distributors" in a like capacity.

F. O. Schoedinger, Chairman, made a stirring speech of welcome to the members to open the meeting. He emphasized the change in attitude of business men which had taken place during the past 25 years. "Today there is no withholding of problems and trade secrets," he said, "but rather a frank discussion in open sessions of evils besetting industry and ways and means of overcoming them." He stated that fear was the greatest difficulty affecting business men today. As an example, he stated that someone tells somebody else that so-and-so is cutting prices and the usual procedure, instead of ascertaining facts, is the launching of retaliatory price cuts. He wound up his talk with the suggestion that business men confer in all frankness with each other to eliminate the devastating results of price wars.

R. B. Flershem, former vice president of the American Radiator Co. and now vice president of the Marine Trust Co., Buffalo, made a most interesting address. He said conditions are not as bad as some would have us believe. Mr. Flershem stated with certainty that the downward trend of business affairs had been checked. Being thoroughly practical, Mr. Flershem illustrated his views by showing that the downward curve of business had straightened out into a horizontal line and the pitch of the descent had been arrested. He emphasized that volume and commodity prices are in much better shape than in 1924. With few exceptions, notably labor, prices have been deflated so that the bed rock has been exposed.

The speaker uncovered the surprising fact that April building figures showed a 12% increase over March, this at a period of the year when a decline is always anticipated and realized. "By September," said Mr. Flershem, "a healthy revival should be felt that will bring matters close to normal." His closing remarks were an appeal to business men to exhibit courage and reflect optimism and to all pressure to sales efforts and advertising campaigns.

The first officials elected under the new title of The National Association of Sheet Metal Distributors are as follows President, F. O. Schoedinger, Columbus, Ohio; Vice President, A. W. Howe, of The J. M. & L. A. Osborn Co., Cleveland, Ohio; Advisory Board, W. H. Donlevy, Eastern Metals Corp., Philadelphia, Pa. Executive Committee: three-year terms, F. J. McNeive, W. F. Potts Son & Co., Philadelphia, Pa.; C. S. Harper, Harper & McIntire Co., Ottumwa, Iowa; two-year terms, W. H. Bowe, The Herrick Co., Boston, Mass.; L. D. Mercer, Republic Steel Corp., Youngstown, Ohio; on-year terms, Fred Fuller, American Sheet & Tin Plate Co., Pittsburgh, Pa.; E. H. Hoffeld, Ferdinand Dieckmann Co., Cincinnati,

W. C. Markle, Secretary, National Association Sheet Metal Contractors, gave a talk on the Standard Practice book and the good work it has accomplished. One-half the original edition has been exhausted and repeat orders for the book have been received steadily in

(Continued on page 29)

A Church Roof of That New Material–ALUMINUM

Sheet metal men have been hearing about a new roofing material — aluminum. Most of us have not had an opportunity to use it.

How it forms, what are its characteristics, how it is used and laid are here set forth in describing the job of Romberger Company, Milwaukee.

IT HAS been becoming apparent for several years that we are witnessing rapid changes in established ways of doing things in the sheet metal field. The industry has discovered better ways of doing old things, but more important is rapidly becoming accustomed to using new materials and equipment.

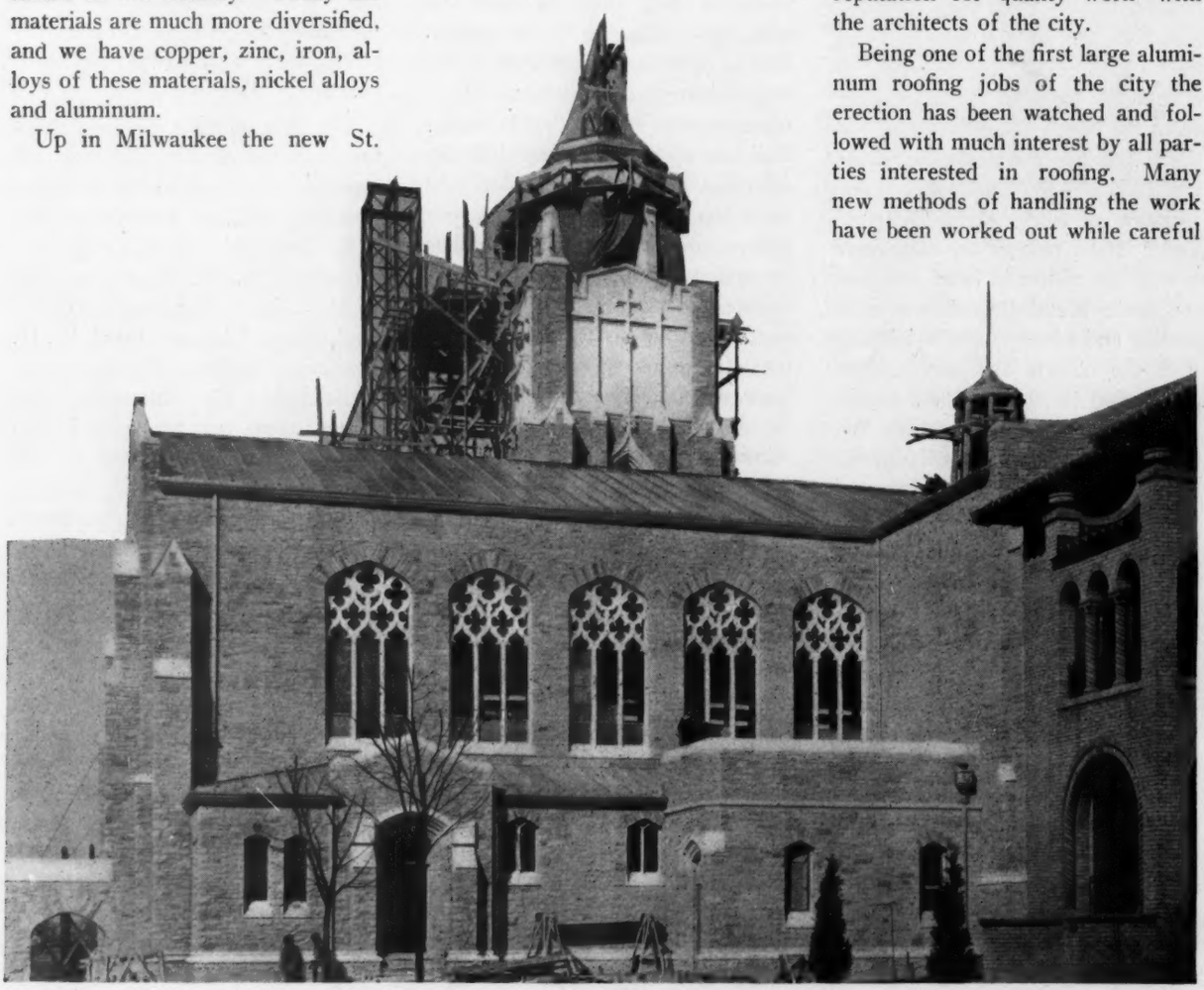
This point can readily be illustrated by the many new materials we are now using, particularly in roofing. Only a few years ago shingles, slate and galvanized iron were the standard permanent roofing materials of the country. Today the materials are much more diversified, and we have copper, zinc, iron, alloys of these materials, nickel alloys and aluminum.

Up in Milwaukee the new St. Sebastians church is being roofed with aluminum. The church is a large structure standing in a high class residential section of the city and when completed will be one of the show churches of the city.

The architects in deciding upon a roofing material desired to use some material which would aid in setting the church apart architecturally and selected aluminum as the proper material to carry out their plans for color and appearance.

The contract for the job was secured by Joseph Romberger of Milwaukee. This contractor has done several fine roofing jobs around the city and has established an enviable reputation for quality work with the architects of the city.

Being one of the first large aluminum roofing jobs of the city the erection has been watched and followed with much interest by all parties interested in roofing. Many new methods of handling the work have been worked out while careful



This is the church as it stands with its white and imposing tower turned to the sun. The roof of aluminum carries forward this keynote of light color and airy permanence

planning, done in advance of actual construction, has resulted in the job running smoothly through to completion.

The church in outline is in the form of a cross with a huge belfry tower set into one of the front angles of the outline. The long axis of the roof covers the main part of the church while the two shorter arms house some of the smaller rooms.

Forming the Sheets

The sheets used for the roof were received approximately 26 inches wide and were cut from rolls into sheets 10 feet long. The shop did not find any trouble in forming the sheets and in fact found the material exceedingly ductile. No trouble was found in running the sheets through the machines to form the desired upward and inward bend for the edges and the bend for the locking cross seam. No special equipment was required to form the sheets and the shop end of the job went through in record time. It was found that a looser setting of the machine was desirable.

Before any laying was done, the gypsum insulator of the roof was covered with a heavy layer of paper. On top of this paper, nailing battens were nailed running from eave to ridge. These nailing strips were put on 20-inch centers and were of 2 by 2-inch lumber cut square. The sheet was formed to lie between these battens as shown on one of the photographs or just as is done in laying a batten or ribbed copper roof. All the battens for the roof both the main section and the arms were put in place before any of sheets were brought to the job. The spacing was also checked to eliminate any future trouble with sheets too wide to go between the battens.

Placing Operations

Laying operations were almost identical with the operations followed in laying the same type of copper roof. The gutter was hung first. The upper edge of the gutter had the usual cross seam formed to hook under the formed cross seam of the lowest sheet of the roofing material. The lowest sheet was slid between the battens and pushed up until the bottom seam had a firm and uniform hold on the seam of the gutter. The sheet was then held in place by one workman while another placed the nailing clips which hold the sheet in position.

Two of the boys, holding section of the crosses. The cross standing on the cab surmounts the large base shown in one of the other photos. The cross at the right is a beautiful piece of design and workmanship

As can be seen in the photograph the edges of the sheet were bent upward to a height equal to that of the batten, or 2 inches, and then turned in about ½ inch to provide a seam for the clip and for the batten cap. The clips were slipped over the edge of the sheet and pulled firmly back on the batten and then nailed. The end of the clip was then bent over to cover the head of the nail.

The sheets were laid all the way up one run of the roof and clipped into position. The upper edge of the top sheet was bent upward and inward along its entire width to hold the ridge roll. In most of the laying operations several rows of sheets were clipped down before the batten cap was put on.

This batten cap is a plain piece of aluminum wide enough to cover the wood batten and form the seam

Looking up the roof. The gypsum insulation is covered with roofing paper. The battens are nailed on top of the paper. The sheets are formed as shown below

which passes around the inward bend of the sheet. When the cap was put on, a special plier was used to turn down the seam against the side of the batten and the seam was then pounded hard against the batten with a wood block and hammer. This type of seam is water and weather tight and is also a permanent fastening for the sheets.

The usual forming processes were done on the cross seams. The workmen cut pieces of wood just as wide as the width between the battens and these blocks were laid on the seam and hammered down to insure a tight seam. One end of the block was cut in a mitre and was used to force the seam into position against the batten at the verticle edge.

The Gutters

The gutters are of aluminum cut from a wider sheet and formed to fit the slope of the two roofs. The edges of the gutter sheet were turned back and clipped directly to the roof without the use of any batten. One of the pictures shows this operation.

A feature of the aluminum sheets is that no soldering or welding is done on the sheets themselves. The entire process of putting the sheet in position and holding it there is mechanical.

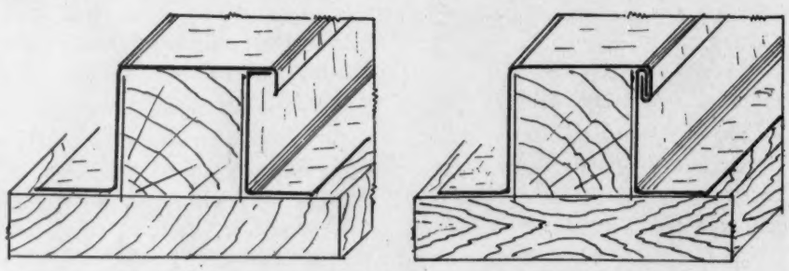
After the gutters were hung in position the welder joined the sections together. One of the features of aluminum is that no soldering has proved feasible, so welding is used to join sections of gutter or sheets. The welding operation calls into play several important and not well known characteristics of aluminum and its uses. The welding operation and its characteristics are worth mentioning.

One of the men from Joe's shop was sent to the Aluminum Company of America's plant to take a course in welding. He applied this knowledge in welding the conductor heads and ornamental units in the shop, but most of the welding of the gutter sections was done on the scaffold by a special welder from the Aluminum company.

Welding Aluminum

Welding of aluminum may be done by autogenous or electric methods. Autogenous welding has been widely and successfully practiced for many years, especially with the pure metal and the less complex alloys and most readers are familiar with the apparatus and technique required for autogenous welding.

Two types of flame are employed, oxyacetylene and oxyhydrogen. Choice of gas is determined by the following considerations. If the intensity of the flame is too great, the metal will be melted too rapidly for the operator to handle easily, with the result that a hole may be melted away at the joint. The repair of such a condition leaves a very unsightly joint. Furthermore, it is obviously difficult and sometimes impossible to bridge a large gap with molten metal. Therefore, as the temperature of the oxyhydrogen flame is considerably less than that of the oxyacetylene, and as the



Drawing of the sheet formation. This system is self capping as one edge of each sheet is formed to cap the batten and lock the adjoining sheet

former, when properly adjusted, will melt ordinary-gage sheet as rapidly as the operator can work, the oxyhydrogen flame is recommended for light-gage small work.

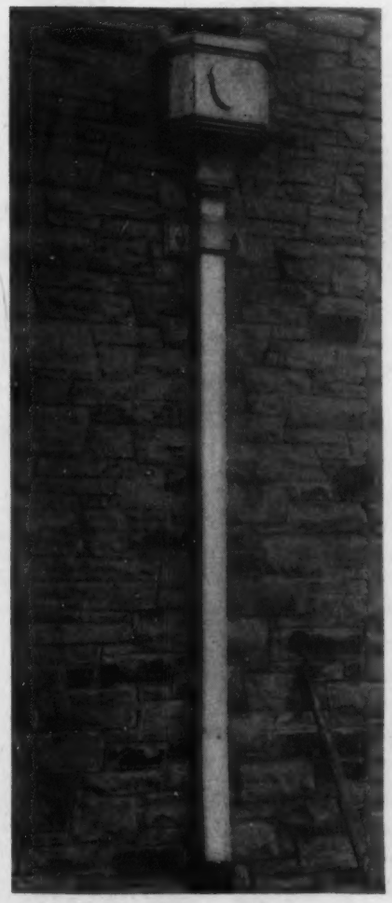
A further objection against the acetylene flame is the possibility of carbon being deposited by an improperly regulated flame. This carbon may interfere with the proper functioning of the flux and will retard coalescing of the molten metal.

Proper Fluxing Essential

All aluminum is covered with a thin film of oxide, which is so strong that even though two lumps of aluminum are melted and brought into contact they will not unite unless this film is broken mechanically or removed in some other manner. In welding aluminum, difficulties due to this oxide film may be overcome by the "puddling" method, which consists merely in mechanically stirring the pool of molten metal, but this has the objection that the films of oxide, though broken up, still remain in the mass of metal. A flux is therefore almost universally used in the autogenous welding of aluminum. It is the duty of this flux to dissolve the oxide as the welding progresses.

A good flux should have the following characteristics. It must have the ability to dissolve oxide very quickly and in such amounts as may be required. The melting point must be below that of the metal and it must not votalilize at the temperature to which it is subjected by the flame. The specific gravity of the molten flux with the oxide dissolved in it must be sufficiently less than that of molten aluminum so that it will quickly rise to the surface and thus carry the oxide out of the weld. Furthermore, the flux must not deteriorate when kept in storage.

Locking and flattening a gutter sheet. The wedge end is used with he bend of the batten side into its proper place



This is one of the artistic conductor heads and downspouts—both of aluminum. Note also the attractive downspout band

Many Fluxes—Not All Good

There are many aluminum fluxes on the market, but not all of them meet the above requirements. Although good fluxes might be considered expensive, successful welding depends so considerably upon the quality of this flux that the choice of brand should be decided solely by performance.

A common method of using flux is to dissolve it in water to the consistency of a thin cream and either apply it to the joint by means of a brush or dip the welding stick into the mixture. Sufficient flux will cling to the welding stick to supply the required amount as needed.

Flux Must Not Remain

Aluminum welding fluxes, when permitted to remain on the metal and then subjected to moisture, will attack aluminum. It is, therefore, necessary to completely remove the flux and this should be done immediately after welding has been finished. This is done by washing the weld with clean water.

Manipulating the Flame

During welding, the torch is never directed forward, as the flame may blow molten metal ahead of the actual welding where melting of the sides of the joint has not yet occurred, with the result that only a gluing action would result. Such a weld is obviously weak.

The flame is so applied that both sides of the joint will be heated and melted equally and simultaneously. With joints of unequal sections, it is thus necessary to direct the flame more against the heavier part. Greater speed is necessary in welding steel and in making a long seam the rate of progress gradually increases as the whole part heats up.

Once welding has commenced it should progress to completion without interruption. When making very long seams, it is desirable to

A closer view of the conductor head. Every seam is welded. The pattern was laid out on the metal

Welding a gutter seam right next to a brace. Note the direction of the flame and the position of the pure aluminum welding bar. The flux is in the bottle

tack the parts together at suitable spots. Though this will introduce short localized buckles, without such tacking the warping due to expansion and contraction will be cumulative and may result in cracking of the parts already welded or in such spreading or overlapping of the parts not yet welded that satisfactory results cannot be obtained.

Several of these welding operations are shown in the accompanying photographs of the job. The shiny surface of the material is evident and laso some of the welds appear to good advantage. The bottle resting in the gutter contains the flux used and the bar of pure aluminum used was dipped into the flux. After the weld was complete the weld was washed both inside and outside with clear water to remove the flux.

Ornamental Crosses

One of the most interesting features of this job is the ornamental crosses built up in the sheet metal shop. These are not aluminum, but are formed in zinc. As can be seen, the design is intricate and one of the crosses is so large that it had to be laid out and built in four pieces, a roof base, a base cap, the middle section and the top or cross proper. This cross is 20 feet high and 5 feet in diameter across the base.

The entire pattern was drawn up in the shop and the pieces cut and fit in the shop. Before the crosses were put into the job they were assembled to see that they fit perfectly and that no trouble would be found on the job.

The smaller cross is 12 feet 6 inches high and 1 foot in diameter across the base. As can be seen these crosses are very delicate pieces of sheet metal work. Although the photographs won't show it clearly, the workmanship is as good as the design and pattern and the finished product will lend dignity and beauty to the appearance of the roof. These units were, of course, soldered rather than welded.

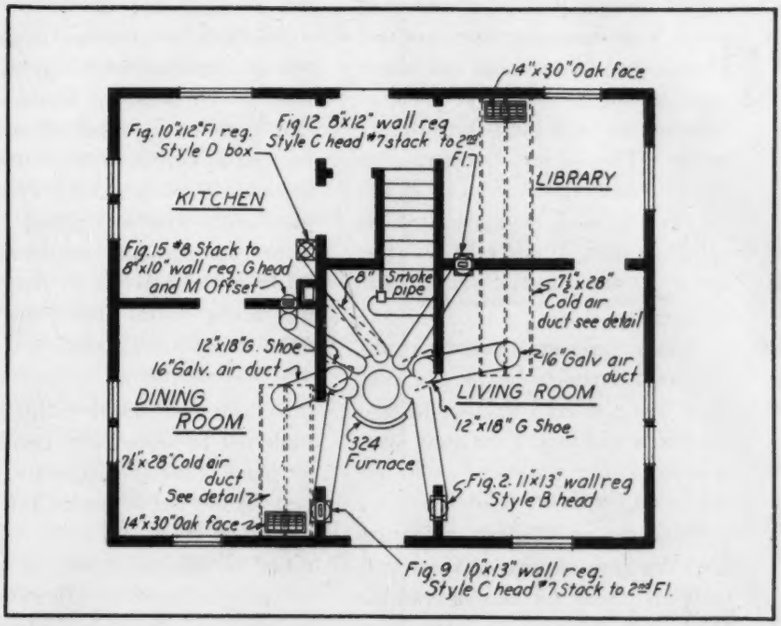
The conductor heads for the job are also interesting. These were formed out of aluminum, the pattern for which was drawn in the shop and the pieces cut and welded before taken to the job. The downspouts lead out of excellently planned spouts and the whole unit is a piece of work any sheet metal man could be proud of.

The base sections for the large cross. There are hree pieces to this much of the cross

Where spouting does not come out of heads the spout and the gutter were welded on the job from scaffolding. This insures a permanent and strong joint and one which will resist ice pressure or leakage from stagnant water. The bands which hold the downspouts to the building were designed with an eye to the beauty of the church and to the excellent appearance of the conductor heads. They carry out the general design of the heads and are shown in one of the photographs.

A closer view of the smaller cross. The design is intricate but very well executed. The crosses are formed in zinc

At the crossing of the two wings of the church a large ventilator of the rotary type is being placed inside a combination aluminum louvre and wooden housing atop the peak of the roof. This ventilator will exhaust from the entire auditorium without the need of any duct work or connecting blower. The exterior of the housing was not on when the pictures were taken. The exterior surface of the housing will be formed in aluminum. The sides will be enclosing panels with louvres running horizontally throughout the height of the panel.


14"x30" Oak face
Fig. 10"x12" Fl reg. Style D box
Fig 12 8"x12" wall reg Style C head #7 stack to 2nd Fl.
KITCHEN
LIBRARY
Fig. 15 #8 Stack to 8"x10" wall reg. G head and M Offset
8" Smoke pipe
7½"x28" Cold air duct see detail
12"x18" G. Shoe
16" Galv. air duct
16" Galv air duct
DINING ROOM
LIVING ROOM
12"x18" G Shoe
324 Furnace
7½"x28" Cold air duct See detail
Fig. 2. 11"x13" wall reg Style B head
14"x30" Oak face
Fig. 9 10"x13" wall reg. Style C head #7 Stack to 2nd Fl.

This Is the Installation Which Has the Floor Drafts

The floor plan shows the warm air runs from the furnace to the registers. Also the cold air returns. The worst draft is across the hall and the doors to the living and dining rooms. Why the drafts?

Now Here's Three More Solutions to That FLOOR DRAFT PROBLEM

IN the March 29 issue of the ARTISAN we showed a floor plan of a house in which trouble was being experienced with strong floor drafts. In publishing the problem we requested our readers to send us their solutions to the trouble.

In the April 26 issue we published six of the answers. We also showed altered sketches giving the changes as closely as we could figure them out from the letters and from the sketches sent in.

Now we have some more replies which we didn't have space for in the April 26 issue. Again we show sketches of the altered heating plans as the authors of the letters laid out the changes.

But before we get into the answers, let's set down again for the benefit of those who don't know what this is all about, the problem as we first published it.

The house is new. It is a ready cut house, but seemingly is tight and without cracks or spaces where air movement can begin. Doors and windows fit as tightly as usually found in a wood house.

Our observations seem to indicate that the real cause of the air movement is in the heating system. There seems to be a decided movement of the cold air going to the furnace and this is especially noticeable around the doorway between the living room and the hall. There is also movement in other rooms of the first floor. So far we have not had these drafts in the second floor.

The drawing at the top of this article is the architect's plan of the first floor. The heating system is shown in its proper location with the leads for warm air and cold air as they were actually built into the house. The leads of the warm aid and the cold air returns are given, so are the sizes of the pipes.

The owner of the house also says that he believes the heating plant consumes at least two tons of fuel a season more than it should. The furnace has a 24-inch fire pot and is of standard make. Now we all know that two tons of coal a season is hardly worth arguing about. Any fairly poor fireman could easily waste that amount of fuel without even having to get up a half hour later. But just for the sake of argument you might also give any ideas on how a different layout for the system could save fuel.

The first answer we wish to publish is that of A. E. Barrington, Heating Engineer, Knoxville, Tennessee. Mr. Barrington calls our attention to some faults with the original presentation in which some important features of the problem were omitted. His letter is as follows:

"Replying to your House Heating Problem given on page twenty-six of the AMERICAN ARTISAN of March 29, 1930.

"Due to the fact that no scale is given on this plan and no plan for second floor is printed, it is difficult to give you a correct layout. But I am sending you a plan and layout, having assumed the dimensions from the data given.

"First, this job has five warm air runs, there should be at least seven, perhaps eight, depending on the rooms and sizes of same on second floor. Also I am quite sure that two rooms are being heated from some one of these stacks and that should never be done. Also, I note, that the stacks are run from the top of the first floor boxes. This custom was discarded long ago. It is not good engineering as this job shows.

"We only use side wall registers under protest for they restrict the flow of air from ten to twenty per cent, depending on the number of angles used and the actual size of opening in bottom of head.

"The warm air runs to living-room and dining room are too long. Why run eight or ten feet of pipe when you can introduce the heat into the rooms directly at the furnace.

"The size of heat pipes not being given, I am assuming there are two 12-inch, two 10-inch and one 9-inch pipes giving a total pipe area of four hundred and forty-three square inches. This is not sufficient pipe area to heat this house if it has the dimensions I have assumed. It would require a pipe area of five hundred and forty-three square inches.

"Under present conditions this job would require heavy and constant firing in zero weather to heat the house and this, I am quite sure, is one of the causes of cold air drafts on the floor.

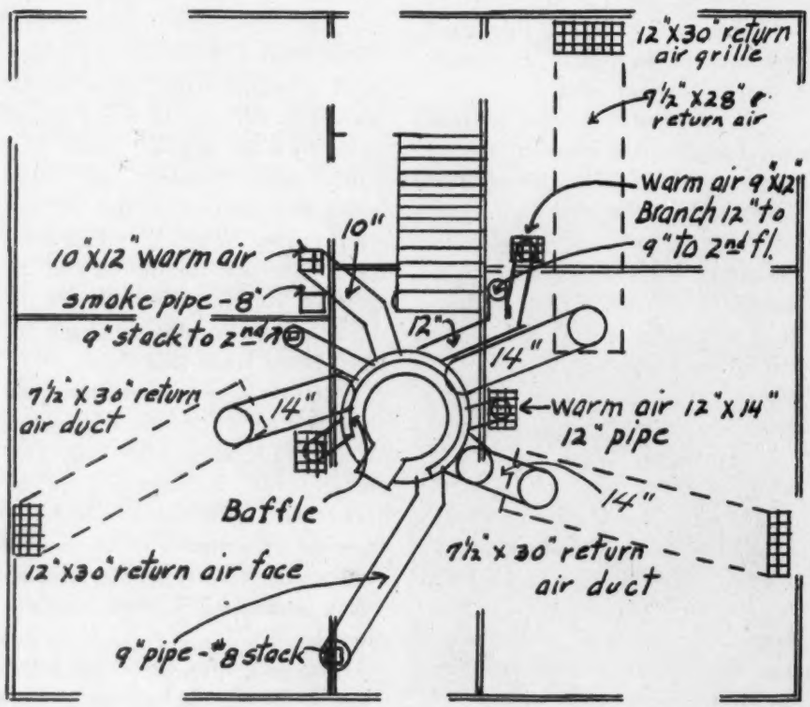
"Now let us take up the return air. We have eliminated the words 'cold air' from our heating vocabulary. The return air is far from 100 per cent efficient on this job. There are two 16-inch return air pipes carrying a total area of four hundred and six square inches. Also the flow is restricted in the 12 by 18 R. A. shoes to a net area of four hundred and thirty-two square inches, less than the area of all the W. A. Pipes. With the present installation the furnace would have to be fired to the extent that the air would be delivered into the rooms at a temperature of around two hundred and fifty degrees Fahrenheit and pass the furnace at a rate of about two hundred and fifty feet per minute in order to heat this house in zero weather. Hence if the library door was closed the air at or near the floor would rush at this rate through the R. A. grill in the dining room. Therefore I do not doubt the complaints of cold air drafts at the floor.

"I am also positive this house could not be heated with two return air pipes, three are necessary. Timbers should not be sealed for R. A. ducts but all R. A. ducts, whether round or square, should be carried independently to the furnace, and no two R. A. ducts should be joined together, but each enter the casing separately. Much depends on the type of R. A. shoe used, but I will not discuss that here. But a baffle, 14 inches high, standing 6 inches off the floor and 4 inches inside of the casing should be used to protect the R. A. openings from the radiant heat from the fire pot. This baffle should have dividers reaching to the floor between each R. A. shoe to prevent interference of R. A.

"Concerning the matter of fuel, I am quite sure this party is using two, possibly four tons of fuel per season more than he should. I am quite sure that an installation similar to the layout I have given would save fuel, heat this house and relieve the same entirely of cold air drafts.

Concerning the furnace, a 24-inch fire pot should be ample for this job.

"Let me add in closing that on all jobs the warm air leads should be of sufficient pipe area combined with an equal R. A. free area to heat the building with air delivered at not to exceed one hundred and seventy-five degrees Fahrenheit. With an air flow over the furnace of not more than one hundred and fifty feet per minute. If this plan is carried out there will be no complaint of cold air drafts



We made this drawing from the letter of Mr. Barrington. We hope we have followed his ideas exactly. You check the plan with the letter

across the floor."

And L. M. Rudolph, of the Langenberg Manufacturing Company, St. Louis, follows this explanation up with another which is short, but very much to the point. He, also, criticises us for leaving out some of the things we should have included. Which doesn't prevent him, however, from telling us what he thinks is wrong with the layout. He says:

"The floor plan furnished is very incomplete. However, from the information furnished I do not doubt that a draft is noticeable.

"I assume the house is two story, with four rooms on second floor. If so, the house is *not* heated. Furnace is not large enough, stacks to second floor are not large enough, plan does not show register in Dining Room, Hall and Library. If these rooms are fitted in combination with second floor risers, then it is *worse*. Cold air returns are two 16-inch or 402 square inches. The 14 by 30-inch faces are large enough for two 20-inch returns, three joist openings to be used. Random

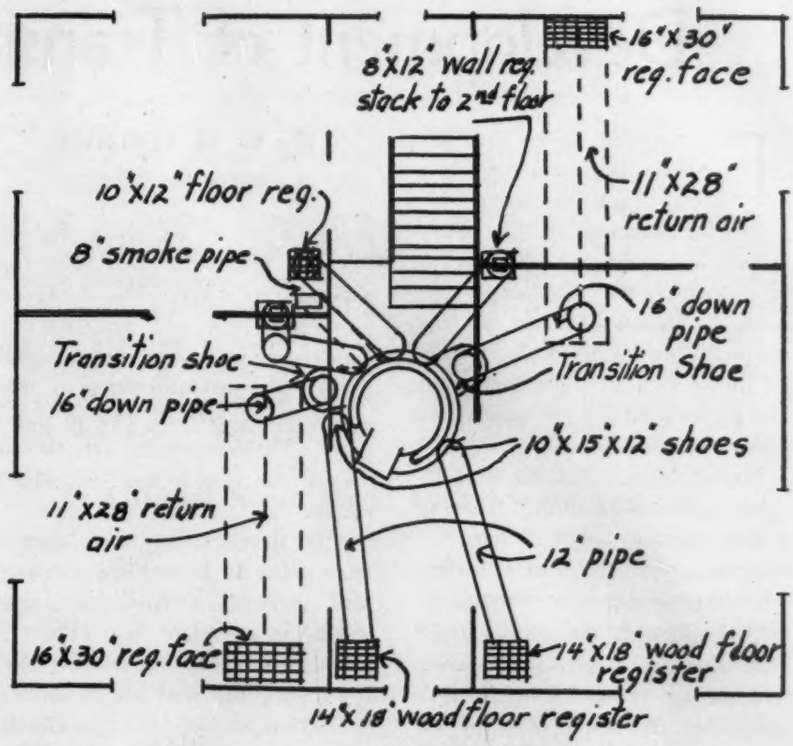
Entire layout of job done very poorly. It seems to me installed in the hardest possible way.

"Certainly it has a floor draft. If a house is not heated it must have and this house is not. I'll bet a $5.00 bill to a lead nickel this was a dollar and cents job.

The last solution we are showing is that from N. R. Turner from way up in Toronto, Canada. He, also, states that some essential data is missing, but from the facts published draws conclusions and shows how he would redesign the layout so that the drafts would be eliminated. His letter follows:

"Owing to the lack of essential data in connection with the problem presented on page 36 of the ARTISAN of March 29, one attempting to unriddle the riddle is moving rather in the dark; particularly as one is not familiar with the throat dimensions of the register boxes designated 'Fig. 9,' etc., or the other stack indicators.

"On the assumption that the grate



This plan shows the layout suggested by N. R. Turner. How does this strike you as a solution to the floor draft trouble?

is 21 inches in diameter, the furnace would be capable of heating approximately 600 square inches of warm air pipe. If, then, the furnace size was selected on the basis of square inches of warm air required, we may assume the pipe sizes to be as follows: Dining Room and Hall, 14 inch = 154 inches; Living Room, 14 inches = 154 inches; Library, 12 inch = 113 inches; Kitchen, 10 inch = 78 inches; leads to stack to first floor, 10 inch = 78 inches. Total, 577 inches.

"Omitting details, it will be observed that the furnace is getting only about 340 square inches of return air. As there is no complaint of lack of heat, the conclusion is that, owing to good chimney draft, and uniform spacing of the warm air pipes on the hood, the insufficient volume of air is sweeping to the two inadequate exists at a high velocity and is being delivered into the rooms very much overheated.

"I would change the present 14 by 30-inch faces to 16 by 30-inch to permit a greater weight of air on them, build the joists to a depth of 11 inches (pan or strips), keeping the other dimensions the same as at present; chamfer the center joist under the return air inlet, and connect the 16-inch down pipe to a transition shoe at the pan. Put a 14 by 18-inch wooden inlet in the Hall and another in the Living Room, where shown on plan and connect 12-inch pipes to Hopper Boxes, sloping and connecting same to 10 by 15 by 12-inch shoes at the heels of the casing. These two pipes will operate at high efficiency and reduce the loads on the two larger pipes, but will not create drafts because of the equalizing effect of the larger body of air moving in the larger, but long ducts, in which there is more friction.

"Assuming that my estimate of the warm air pipe area is about correct, we now have, total square inches warm air = 577 inches; total return air = 628 inches.

"It is obvious that the removal of so large a volume of low-temperatured air from the rooms will permit the warm air to sink to a much lower level before its heat is

(Continued on page 40)

Development of Transition Fitting

By **W. R. HAINES**
Contributing Editor

THE drawing shown with this article is the development of a special transition fitting submitted for development. The information submitted was not sufficient to determine the true angles desired, the amount of offset, etc., but the procedure for developing a similar fitting with different dimensions and angles would be the same as the fitting shown.

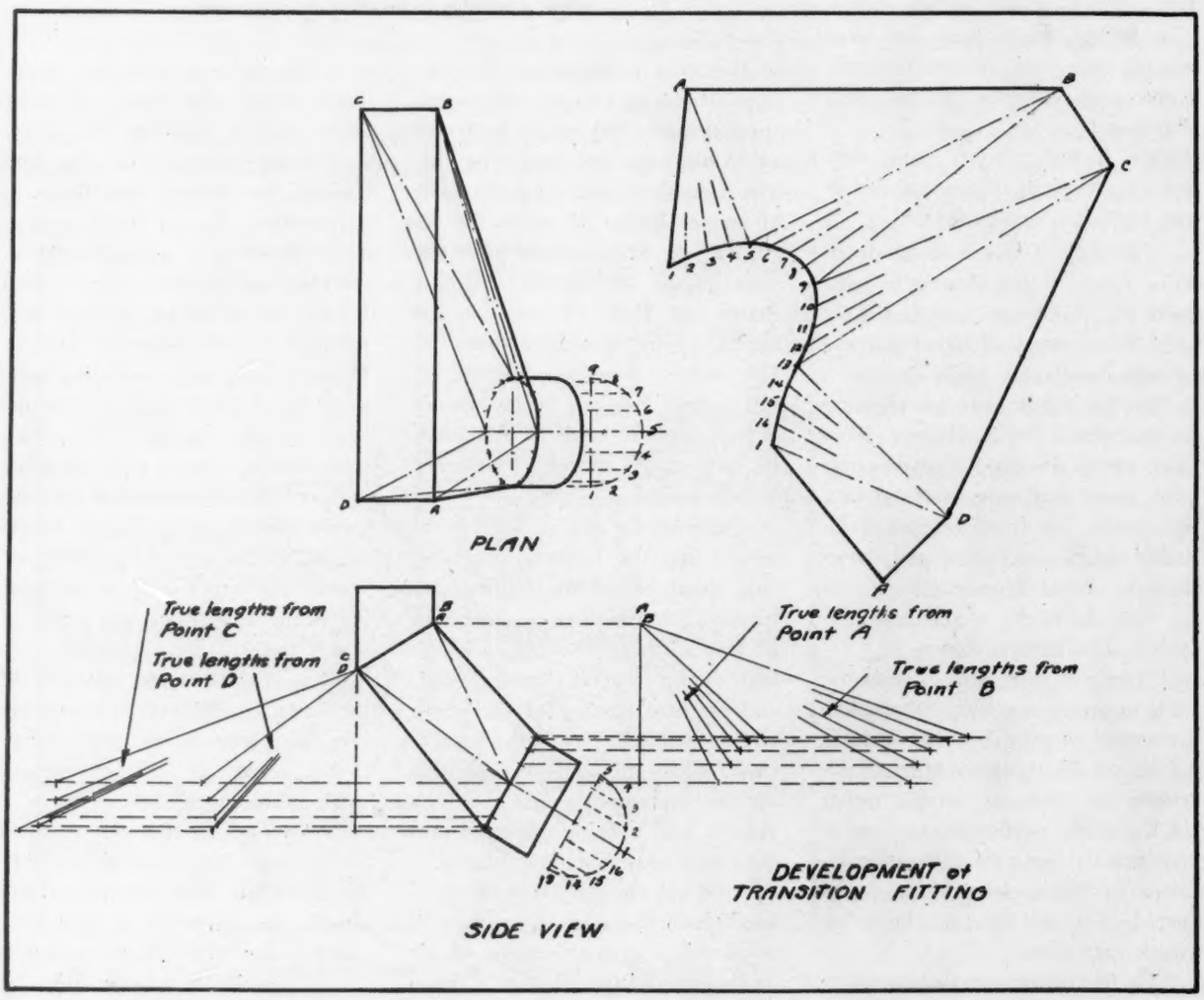
This problem in general is to develop a transition fitting from an 8 inch round to a 6 x 29 inch rectangular, with the round section offset approximately as shown.

To begin with, the side view and plan view were drawn as shown. The fitting is shown with three parts, but the development of the center section or transition piece is the part presented. The first step was to draw a semi-circle as shown on the side view, and divide the circumference into a number of equal parts. The circumference in this problem was divided into 16 equal parts. These segments are shown on the plan view in the form of an ellipse.

The development was started from point A. Line AB was drawn first. This line is shown as a true length on the plan view. Point 5 was then located. The method used for finding the true lengths of the lines from points A and B is clearly shown in the side view. The points on the auxiliary semi-circle drawn were projected to the plane of the end of the transition fitting. Through points 1 and 9, horizontal lines were projected and points A and B were also projected.

The true length of line A5 is found on the side view by stepping off on the base line which was projected through point 5 a distance equal to the distance A5 as shown on the plan view. The hypotenuse of the triangle is the true length of A5.

After the true length of line A5 is found, it is necessary to find the true length of line B5 in order to definitely locate point 5 in the development. The true length of line



B5 is found in the same manner as outlined for line A5.

Since point 5 is located, then points 4, 3, 2 and 1 can be located by determining the true lengths of lines A4, A3, A2 and A1 as outlined, and using the distances between points as radii. In other words, an arc is drawn from point 5, using the distance between points as a radius. Then an arc is drawn from point A, using the true length of line A4 as a radius. The point of intersection of these arcs locates point 4. The same method is used for points 3, 2 and 1.

Points 6, 7, 8 and 9 are located in the same manner as outlined above, except that they are located from point B. After point 9 is located, the next step is to locate line BC. The true length of line BC is shown on the side view. Using this length as a radius, an arc is drawn from point B. The next step is to determine the true length of the line C9. This is shown on the side view, and follows the same method as outlined for determining the true lengths from points A and B. Using the true length of C9 as a radius, an arc is drawn from point 9. The intersection of the two arcs from points A and B locates point C.

By using the true lengths of lines C10, C11, C12, and C13 as radii, and the distance between points as radii, points 10, 11, 12 and 13 are located in the same manner as outlined for points 1, 2, 3 and 4.

The next step is to locate line CD. The true length of line CD is shown on the plan view. Using this length as a radius, an arc is drawn from point C. Then an arc is drawn from point 13 using the true length of line D13 as a radius. The intersection of the two arcs locates point D.

Points 14, 15, 16 and 1 are then located in the same manner as outlined for points 1, 2, 3 and 4, using the true lengths of lines D14, D15, D16 and D1 as radii through point D and the distance between points as radii.

The last step is to locate line DA. This is done by drawing an arc through point D with a radius equal to line AD as shown on side view and an arc through point 1 equal to line A1. The intersection of the arcs locate point A and line DA, and the development is completed. The pattern can be changed so the seam will be on the shortest side or at any point desired. Allowance for laps or joints are not shown.

Author's Note:—You will note on this drawing I have changed the angle and slope of the elevation of the drawing. I do not approve of a fitting of this kind simply because it makes too abrupt a turn for air, so have made it as I would for myself. The drawing can be developed into the required height of 20 inches by simply shortening the transition layout. The top piece of the rectangular fitting is made simply by adding the required stock from points A, B, C, D and A, and riveting corners, or by making it in a separate piece and using S hooks or rivets, depending on gauge of material used.

National Sheet Metal Distributors Meeting

(Continued on page 19)

ever-increasing lots.

Thomas D'Arcy Brophy, Vice-President of the Revere Copper and Brass Company, Inc., New York, urged distributors to exert greater efforts in the distribution of copper products.

Led into the subject by Robt. H. Lyon, Chairman of the Trade Practice Conference Committee, the members indulged in a snappy and enlightening discussion regarding the practice of the collective buying of carload lots. This procedure was condemned as unfair in trade. However, it was unanimously decided that definite action at the time of the meeting would be premature and untimely, and that the committee should continue its investigations.

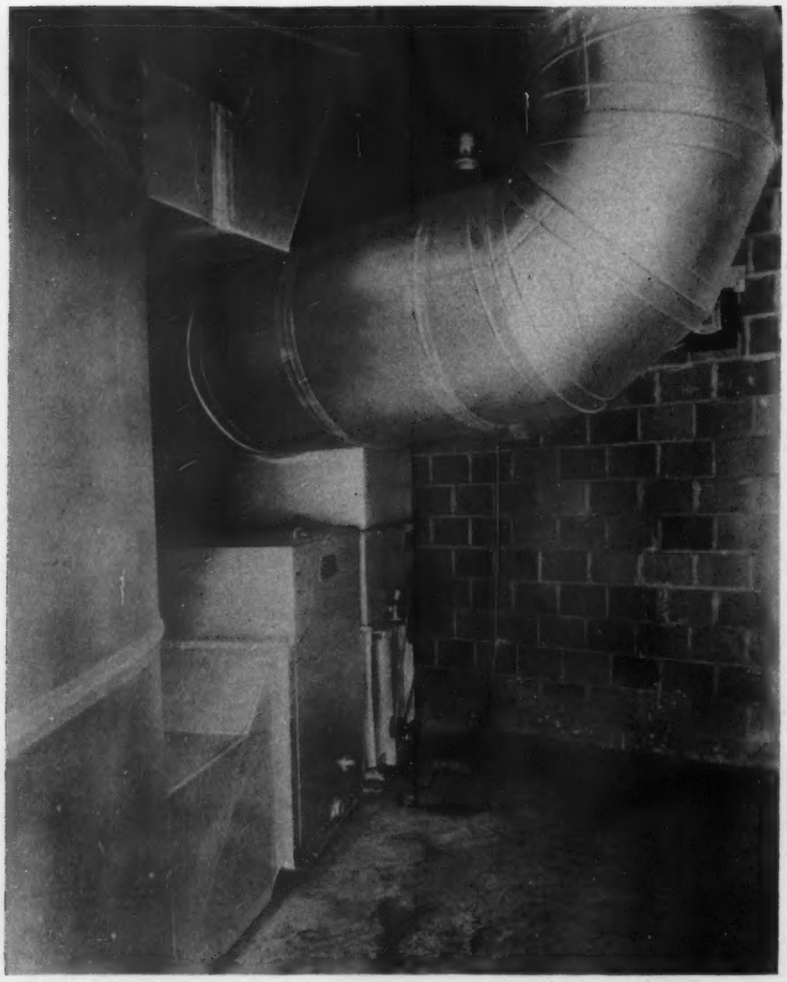
A set of standard rules has been drawn and one of the possibilities resulting from the discussion is that the matter will be discussed informally with the Federal Trade Commission in an effort to decide whether these rules are feasible and non-conflicting with commission rulings. At any rate, a conference with the Federal Trade Commission was deferred until such time as the commission itself has clearer views in relation to a standard code than now exists.

Karl Roth of the Braden Mfg. Co., Terre Haute, Indiana, gave a talk on the subject: "To What Extent Is the Margin on Galvanized Roofing Affecting the Volume of Sales?" Robt. H. Lyon summed up his views with the statement that there was not sufficient profit in the venture. Frank McNeive told of making money on his firm's sheet sales through a system of quantity differentials.

The convention was not all serious business. As a matter of fact it couldn't be when held in Canada. One of the more amusing incidents of the meeting is worth publishing. This incident has to do with the mystery of Bill Tobin's pants, or more rightly, his pajamas.

The trouble started over Stuart Raub's convention speech. He had to say something and was so worried that he spent most of the time between Philadelphia and Canada rehearsing. He had for collaborators John Tobin and Jack McGeady of Lancaster, Pennsylvania, and his brother, Bill, of Philadelphia. From all reports it took most of the night to whip the speech into form. The difference in opinion grew so warm that for one reason or another Tobin, who had left Philadelphia with a full length pair of pajama trousers, arrived at the Falls with the pajamas cut down to running trunk size. John vows Bill committed the dastardly act. Bill insists Stuart's eloquence burned the pants off at the knees. Jack's part in the discussion remains an unsolvable mystery for the reason that he just exercised his sunny smile in lieu of words.

A Coal Burn
Automaticall
Washed Air,
Fan Propelle
WARM AIR FUR



This side of the furnace shows the motor side of the fan and washer. The cold air is brought into the fan in large round pipes as shown. These pipes were used since the basement near the fan and behind the furnace is of little use. The square casing between the fan and the furnace is the air washer

WE present on these pages photographs and heating plan layouts for a warm air heating system which contains within itself every element necessary to make a true air conditioning system.

Too often furnace men call a heating plant an air conditioning system when all there is to the job is a furnace and a fan. In this installation, however, the fuel is fed to the furnace automatically, the cold air is brought into the system and forced through the furnace casing and ducts by a blower fan. Before the air is heated it is washed to reduce or raise the temperature depending on outside conditions and to remove impurities.

This excellent job was installed by L. H. Pardee of Warren, Ohio. The residence is located in Warren and is owned by Ed Geissman. In connection with the selling of the job an interesting feature is worth relating. Mr. Geismann was an interested spectator at a sales talk being given another prospect by one of the Lennox Furnace Company salesmen. The discussion he heard evidently stuck for when he came to build his new home he called on Mr. Pardee and gave him to understand that he wanted a warm air system like he had heard about put into his home. Not only was he insistent on a certain system, but he was also thoroughly sold on warm air as a heating medium for high class homes. Pardee sold him the job we are describing.

This installation has attracted a great deal of attention throughout northeastern Ohio. The owner is mighty proud of his system and has become one of the best salesmen the contractor has in his territory.

Here are a few details of the house. The house contains 12 rooms and 5 baths. These are on the first and second floors. In addition there is a large den in the basement. In order to arrange the den the heating plant has to be placed in one corner of the basement, another feature which made a forced air system desirable. The basement is 10 feet clear in height.

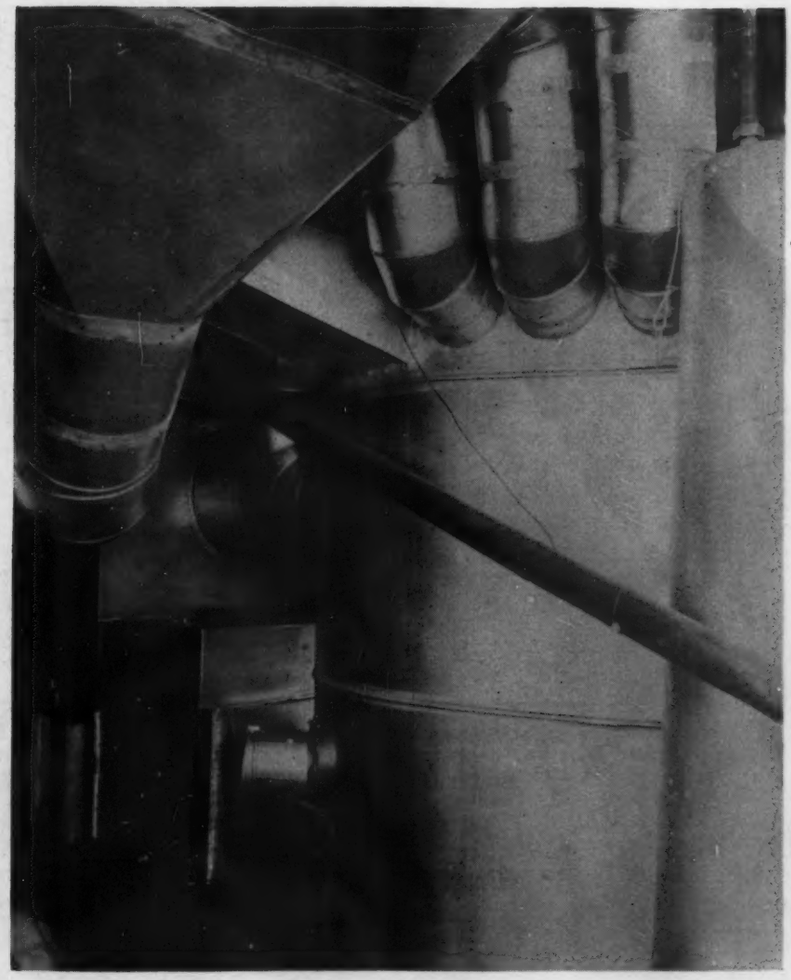
This shows a view of the living room. The warm air is outlets placed 8 feet above the floor. Cold a s taken outlets seem to be very much in keeping wi the costl

Burning,
ically Stoked,
Air,
belled
FURNACE JOB

The heating plant contains many noteworthy features. The furnace is a coal burner, but an Iron Fireman is used to make the firing automatic. This stoker is operated in conjunction with thermostatic control which leaves nothing for the owner to do except fill the hopper of the stoker.

The furnace is a Torrid Zone 62-35 S type made by the Lennox Furnace company. The air is washed and forced through the system by a Silent Air washer and fan made by the company of the same name.

Before we give the details of the installation we should like to point out that the installation has been in operation all through the past winter and the heating of the house has been all that the owner could wish for. It is interesting to note that tests were made through the winter to determine whether the fan had any effect on air stratification in the various rooms. In the rooms tested no difference in temperature was noted between the breathing line and heights of 16 and 18 inches off the floor.



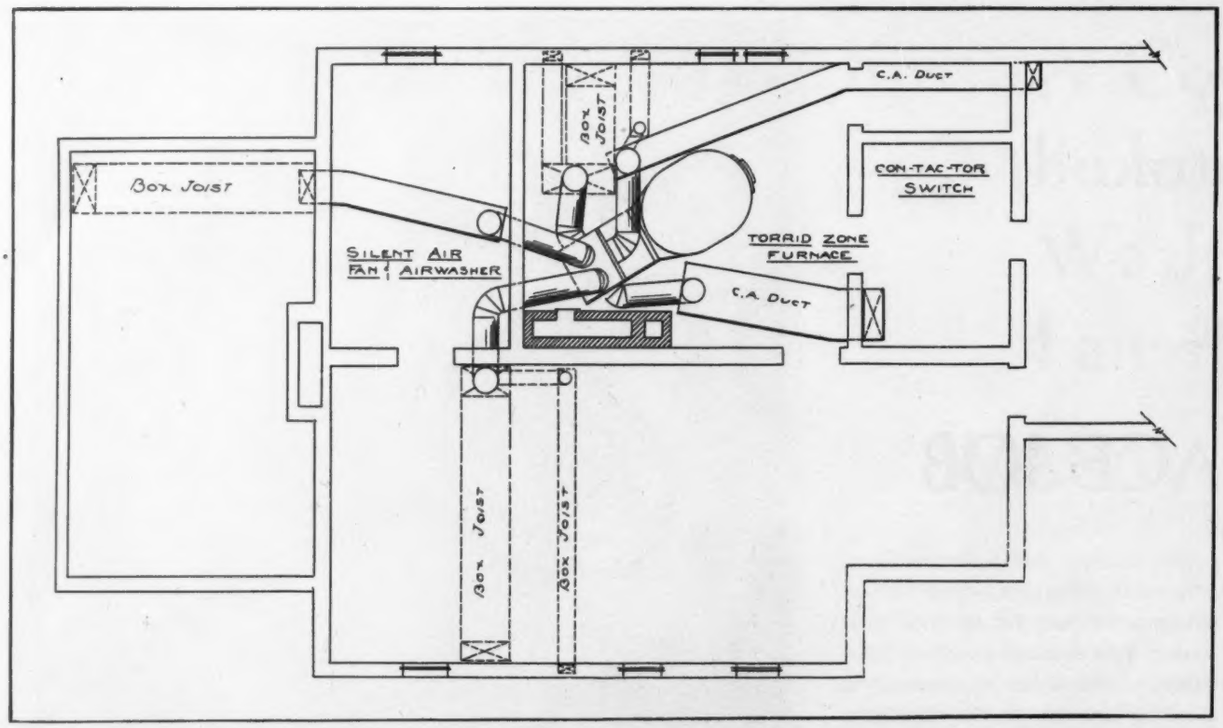
This is the other side of the fan and washer. The large round pipe in the top foreground connects with a flat cold air return through a large transition fitting. Note how the warm air leads, both round and flat, are taken over the cold air return. All the joints are wrapped

n. The arm air is taken into the room through wall Cold a s taken out through floor faces. The wall ping wi the costliness of the house and its interior

By referring to the two basement layouts shown, one giving the warm air system and the other the return air system, it will be seen that the system uses both round pipe and trunks to carry the air through the basement and to the stacks.

Let's take up the return air layout first. Return air is taken from both the first and second floors. The leads are all taken into the fan housing through round pipes. These round pipes show in the plan and also show up clearly in the photographs of the basement. Two of the pipes are of large size and required some skillful sheet metal work to get the transitions from round to duct at the ends of the round pipe leads.

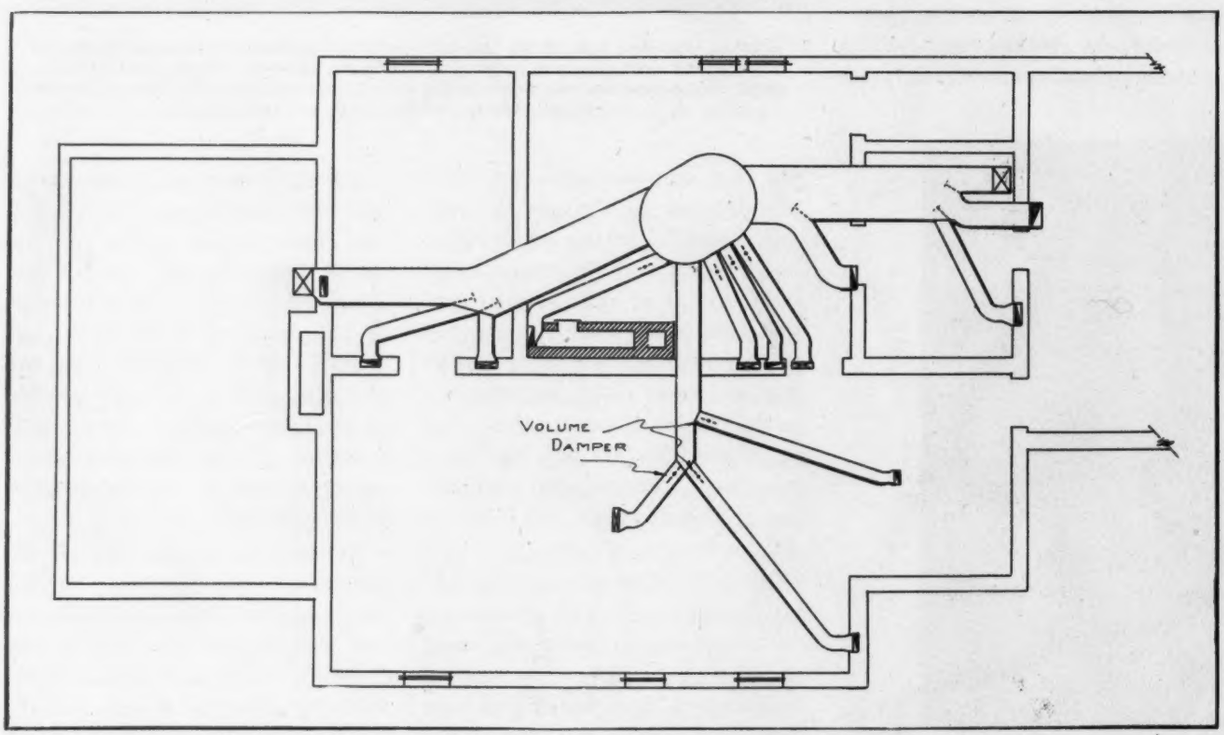
Where long runs of cold air are necessary, the air was carried through joist boxes as shown on the plan. In the fore part of the drawing two parallel cold air returns in joists can be seen, one taking air out of the first floor and the other serving the second floor front. The first floor run is twice



This plan shows the cold air return part of the system. Notice the round and flat leads used and the amount of pattern cutting required to make the connections. The long cold air returns are carried in lined boxed joist ducts. No round pipe is used excepting near the furnace, or, in other words, where floor space is not essential

the size of the second floor duct. As can be seen, three return ducts are used. These are connected to the fan casing with round pipes where the space over the floor is useless in any event. But the flat ducts carry the air through the used parts of the basement.

(Continued on page 40)



This is the layout of the warm air part of the system. Here practically all the air is carried through flat ducts placed up against the ceiling of the 8-foot cellar. The three round pipes are all short leads and enter stacks almost over the furnace. A damper for volume control is placed in every branch from the main line. Without these dampers the system

Air Infiltration Through Brick Wall Construction

MOST furnace men today understand the importance of estimating the heat losses through walls in buildings they are figuring on heating. It is also quite generally understood that different materials of various thicknesses have different coefficients of heat transmission, or in other words, that walls of different materials or of different workmanship permit air to filter in and heat to filter out with widely varying losses. The importance of this fact should be taken into consideration whenever a house is to be heated.

Right along this line are some tests recently completed on walls of different materials and also different workmanship. In addition to the use of plain and plastered brick walls, tests were made on painted walls and such details as the carrying of the plaster coat to a tight joint with the floor system or foundation.

Two types of brick were used in the construction of these walls —a hard face brick and a more porous type, commonly known as Chicago clay brick. The dimensions of the hard brick in inches, order of length, width and thickness were 8⅛ in., 3¾ in., 2 11/32 in., and for the porous type 8 1/16 in., 3 9/16 in., 2 5/16 in. The average thickness of the vertical and horizontal mortar joints for all walls was approximately ¼ in. and ½ in. respectively. Three of the walls were slushed with cement-lime mortar, the other with lime mortar. The walls were constructed in a way to differentiate between good and poor workmanship.

Plain brick walls vary greatly with respect to air infiltration. Of the three factors—brick, mortar and workmanship—workmanship seems to be of most importance, the composition of the mortar as to cement and lime content next in importance, and the brick the least important. The infiltration for the 13-in. plain brick walls tested ranged from 2.71 to 10.35 cu. ft. per hr. per sq. ft. of walls.

Gypsum plaster, when properly applied, stops almost all infiltration. The results show that plastering stopped about 96 per cent of the leakage of the plain brick wall. Plastering directly on brick seemed to be slightly better than on metal lath with a furring space. The difference is small, and the saving due to plastering directly on the brick would be negligible as compared to the saving in heat transmission effected by the furring space in the other construction.

The effectiveness of plaster in stopping infiltration in actual building construction is probably much less than that found in these tests. Cracking of the plaster, imperfect sealing of the plaster sheet at the wood trim, such as at the baseboard, would decrease the effectiveness greatly. A test made of a baseboard equipped wall, with a furring space, showed an effectiveness of only 50 per cent of that obtained with a perfectly sealed plaster wall.

Two ordinary coats of a linseed oil paint applied directly to the surface of a porous brick wall reduced the leakage by 9 per cent. A third coat applied with extreme care made the total reduction 28 per cent.

One heavy coat of cold water paint applied directly to the surface of a hard brick wall reduced the leakage by 50 per cent.

A study made on a typical 10-story office building, considering all walls to be 13-in. brick with furring space, metal lath and plaster, indicates that the infiltration heat loss through the brick would range from 6 to 25 per cent of the infiltration heat loss through the windows and doors where the plaster is not properly sealed. For perfect sealing of the plaster, these percentages would be reduced to 0.5 to 2.7, respectively.

Each of the walls was subjected to wind pressure corresponding to wind velocities ranging from about 5 to 30 mi. per hr. All of the walls were permitted to age at least five months before the tests were made. Walls No. 4 and 5 were later plastered on metal lath and furring space for further testing. After removal of the plaster, Walls No. 4 and 5 were used for the determination of the effectiveness of several kinds of paint on infiltration. Wall No. 6 also was re-tested with an application of plaster directly on the brick, without lath. Wall No. 7 was used only to determine the effectiveness of plaster, no tests being made on the plain brick wall.

Wall No. 6 was considerably poorer from the infiltration standpoint than the other walls. Wall 6 was constructed of porous brick and lime mortar applied with poor workmanship. By improving the workmanship and using cement-lime mortar, rather than lime mortar, in Wall 4, the infiltration loss is cut to a little less than 50 per cent.

Application of one coat of interior cold water paint reduced the leakage at 15 mi. per hr. on Wall 5 by 52 per cent. When the cold water paint was washed off and the wall treated to two coats of a white oil paint, the first coat gave a reduction in leakage at 15 m. per hr. of only 2 per cent, while the second coat gave an additional reduction of 4.5 per cent, or a total of 6.5 per cent. When a third coat was applied, an additional 19 per cent reduction was secured or a total reduction of 28 per cent for the three coats.

Base for Chimney and Hood

By **L. F. HYATT**
Contributing Editor

THE base for a chimney shown in the accompanying illustration is one which fits on an inclined roof having a pitch of 45 degrees. The base is square and the opening at the top is round. The hood is one of simple yet good construction, which can be used wherever necessary to overcome "wind rebound." If a tall building is close beside a low structure the wind strikes the tall building and rebounds and prevents proper draft. When used for this purpose the cap of the hood is placed parallel with the side of the tall building.

To begin the plan and elevation of the chimney base, first draw the center line a-b. Next draw a horizontal center line m-d. Now with the dividers set half the width of the lower opening of the chimney base, and with the intersection of the two center lines just drawn, as a center, strike arcs intersecting the center at c, m, b, d. Through these points draw vertical and horizontal lines describing the opening, and letter the corners A, B, C, D. Next, with a radius equal to half the diameter of the round opening of the chimney base, and the intersection of the vertical and horizontal center lines as a center, draw a circle representing the opening. Now divide each quarter of this circle into four equal parts, and number as shown in the plan. In this case the upper half only need be divided. From corners B and C lines are drawn to the points just located on the circle. This completes the plan.

To begin the elevation the 45 degree line EF is drawn representing the slope of the roof, and from corners B and C perpendicular lines are drawn intersecting the 45 degree line just drawn, at E and F. Next decide upon the distance e, f, and draw a horizontal line through f. Now erect perpendicular lines from points 1, 2, 3, 4, etc., in the plan, intersecting the horizontal line just drawn, locating points 1, 2, 3, 4, 5, etc., in the elevation. Now draw lines from EF to these numbers. Next step off on the vertical center line a distance equal to the desired width of the collar, and draw a horizontal line through this point. Now draw perpendicular lines from 1 and 9 intersecting the horizontal line just drawn, thus completing the elevation of the chimney base.

Before beginning the development of the pattern it is necessary to complete the diagram of true length lines. First draw the perpendicular line GH, then draw horizontal lines from points E and F and point 1 in the elevation, and letter the points of intersection of the vertical and horizontal lines GX and H as shown in the diagram. Now on the horizontal line XJ step off a distance equal to C-1 found on the plan, and draw a line from this point to G.

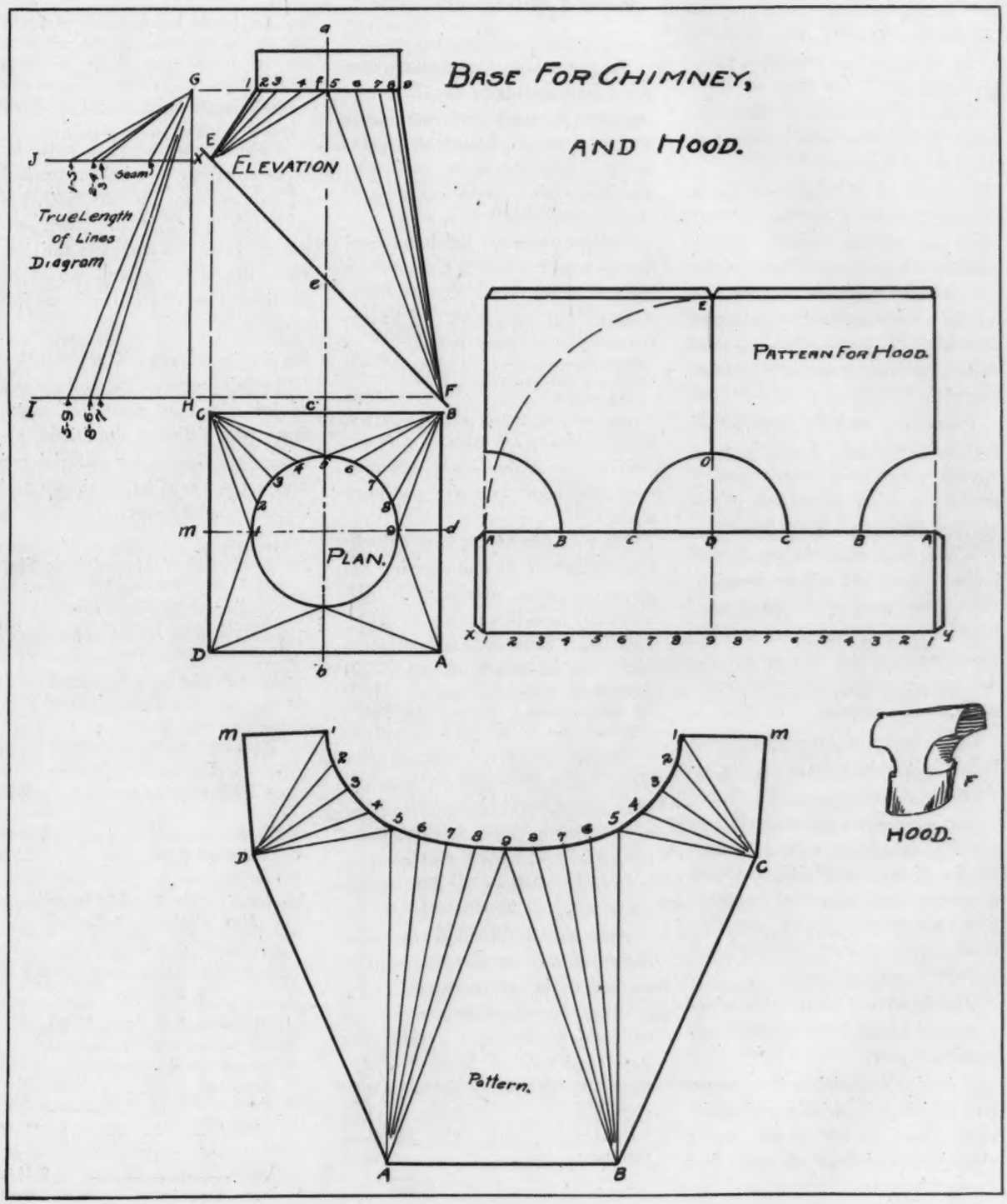
Next step off on XJ the distance O-2 and draw a line to G. Next step off the distance C-3, found on the plan, on the line X-J and draw a line from this point to G. The true length of C-5 is the same length as C-1 and the true length of C-4 is the same length as C-2. Next step off on the line X-J the distance m-1 and draw a line to G from this point. This is the true length of the seam line. This completes the true lengths of the short group of lines. Next the distances B-5, B-6, B-7, B-8, B-9 are stepped off on the line H-I and lines drawn from these points to G, thus completing the true length of the group of long lines.

As stated in a previous problem there is an advantage in beginning the development of the pattern with the triangle mid-way between the seam ends. In this case the first triangle to construct would be A-B-9. The procedure is as follows: First draw a horizontal line and upon this line step off the distance A-B found on the plan and letter the points A-B. Now with the distance 9-G in the diagram of lines, which is the true length of the line B-9 found on the plan, and with A as a center strike an arc. Next with the same length and B as a center strike another arc intersecting the arc just drawn, thus locating point 9 of the pattern. As these points are found lines should be drawn as shown on the pattern, A-9, B-9, etc. Next from the group of true length of lines, take the distance from 8 to G, which is the true length of the line B-8 on the plan, and using A as a center strike an arc. Then with B as a center strike an arc as before. Now from the plan take the distance from 9 to 8 and with 9 on the pattern as a center strike an arc intersecting the arcs drawn at either side of point 9, and locating the two points numbered 8 on the pattern. Continue in this manner with the points 7, 6, 5, in the true length of lines, always being careful to use the lines in the proper order, and with the distances 8-7, 7-6, etc., in the plan. The last lines drawn of the pattern were 5-A and 5-B. Next, from the diagram of true lines on the angle GXJ take the distance 5 G as a radius, which is the true length of 5 C, also of 5 D, and with the two 5's on the pattern as centers strike arcs of indefinite length. Now from the elevation take the distance from E to F which is the true length of the sides B-C and of A-D of the plan, and with the points A and B as centers strike arcs intersecting the arcs just drawn. Letter these points of intersection C and D as shown on the pattern. Next from the group of true length lines take the distance 4-G and with C as a center, then D as a center, strike arcs. Then with the distance 4-5 from the plan strike an arc intersecting the

arc just drawn. Continue in this manner with the other lines to and including the line c-1, and d-1. Now from the plan take the distance C-m or D-m, which are the same, and with C as a center, then D as a center strike arcs. Next, from triangle GXJ take the distance from the point marked seam, to G and with 1 in the pattern as a center strike an arc intersecting the arc just drawn and locating point m on the pattern. The collar is then made by seaming a piece the desired length and width and attaching to the base with an elbow edge or riveted seam. No allowance is made for the seam, which may be either riveted or grooved. An allowance on the straight edges where it joins to the roof should be added. This completes the pattern.

The hood F is a type simple in construction and one which may be made with a minimum amount of waste material. First draw stretch-out line XY and upon this line step the distances 1, 2, 3, 4, etc., from the plan. Next draw another line

(Continued on page 40)



OVERHEAD

Here's One Way to Figure It

THE past year has been one of disappointment to many people in many ways and we presume the usual number are still trying to figure out how they managed to fall so far short of their preliminary estimates of earnings, when final results were obtained at the close of the year.

In spite of the fact that much has been written on the subject, there can still be found a goodly number who are not clear on the subject of Overhead and who do not fully understand to what extent Overhead is increased when less than a normal shop force is employed.

There are various methods of figuring Overhead. Some figure it against yearly sales; some against productive labor time, and others against productive labor payroll.

While these methods are correct in many cases and will be found to serve the purpose satisfactorily, they have many variations and improvements, which are useful under certain conditions, when more accurate information is desired.

The subject of Overhead distribution is broader than is usually believed.

Many concerns are finding it to their advantage to make scientific studies of their overhead problems, analyzing their individual condition and requirements and applying those particular methods which best suit their circumstances.

The important thing is to adopt a method which best fits your own particular case.

It is also essential to have a system which will quickly and easily show the correct result under changing conditions at any time during the year.

From a Bulletin Issued by the Wisconsin Sheet Metal Contractors Assn.

We present an hypothetical case based upon an 8-hour day, 26 working days a month and working a normal force of 30 productive laborers. Also the same case with one exception of working only 10 men instead of 30.

For convenience, we have used figures which would not necessitate the use of fractions.

Assuming total yearly overhead	$22,464.00
Overhead for one month would equal	1,872.00
Overhead for one day (1/26 of a month)	72.00

30 men working 8 hrs. per day = 240 hrs.
$72.00 divided by 240 hours = 30 cts.
which is the amount each man must earn per hour to cover overhead alone.

On the basis of working only 10 men instead of 30, and carrying exactly the same overhead, it will work out as follows:

Total yearly overhead	$22,464.00
Total monthly overhead	1,872.00
Total daily overhead	72.00

10 men working 8 hours a day = 80 hrs.
$72.00 divided by 80 hours = 90 cts.

Be sure to get it clearly in your mind that the 30 cents per hour per man and the 90 cents per hour per man in the two foregoing illustrations are the amounts that must be earned *in addition to the regular wage paid.*

Now let us distribute the total daily overhead of $72 over all jobs worked on in each case.

When 30 men were at work, let us assume that on a certain day their total time of 30 × 8 or 240 hours was distributed as follows:

Job No. 1	80 hours
Job No. 2	100 hours
Job No. 3	60 hours
Total	240 hours

The distribution of the $72 overhead would be as follows:

Job No. 1—	80 hours	× 30c =	$24.00
Job No. 2—	100 hours	× 30c =	30.00
Job No. 3—	60 hours	× 30c =	18.00
Total	240 hours	× 30c =	$72.00

When 10 men were at work, let us assume that all of them worked all day on one job only, identical with Job No. 1, taking their entire 80 hours to complete the job. Here the $72 overhead would be distributed to this job only as follows:

Job No. 1— 80 hours × 90c = $72.00

We will now compare the costs of Job No. 1 as completed under these two different conditions, assuming the figures for material and contract price to be as shown and the same in both cases.

Job No. 1—One of Three Jobs in Shop with 30 Men Working 2 2/3 Hours Each or 80 Hours Total

Contract estimated and taken for $125.00

Requires

1,000 lbs. steel @ 4c	$40.00	
Labor, 80 hours @ 30c	24.00	
Overhead (see distribution above) 80 × 30c	24.00	
Total		88.00
Profit		$ 37.00
Percentage profit		29.6%

Job No. 1—Only Job in Shop with 10 Men Working All Day or 80 Hours Total

Contract estimated and taken for $125.00

Requires

1,000 lbs. steel @ 4c	$40.00	
Labor, 80 hours @ 30c	24.00	
Overhead (see distribution above) 80 × 90c	72.00	
Total		136.00
Loss		$ 11.00
Percentage loss		8.8%

Using the same example and distributing overhead on a basis of direct wages instead of direct hours, if our normal force is 30 men who require a uniform rate of 30 cents per hour, we would have the following condition:

Total overhead for one month as shown above.....$1,872.00
Total direct wage for one month 1.872.00
Percentage of overhead to direct wages

$$\frac{1872}{1872} = \text{or } 100\%.$$

Thus, every man must earn double his rate of wage in order to take care of overhead and regular wages paid him.

If but 10 men are employed, direct wages become $624. Overhead remaining $1,872, the percentage of overhead to direct wages will be $1872 \div 624 = 300\%$. Under these conditions, each man must earn three times his wage rate to take care of the overhead alone. He must, of course, earn his wage rate besides.

Let us again use the figures assumed in the foregoing examples and make comparisons of costs under varying conditions, using the productive wage basis for our overhead distribution.

To distribute the $72 overhead over the three jobs worked on by 30 men we must first secure the productive wages spent on each job, which we do as follows:

Job No. 1— 80 hours labor@30c=$24.00
Job No. 2—100 hours labor@30c= 30.00
Job No. 3— 60 hours labor@30c= 18.00

Total..... 240 hours labor@30c=$72.00

Our overhead percentage under this condition, it will be remembered, was 100%. To distribute the $72 overhead we multiply the wages on each job by 100% and secure the overhead chargeable to each job. We now have the following results:

Job No. 1—$24×100%=$24.00 overhead
Job No. 2— 30×100%= 30.00 overhead
Job No. 3— 18×100%= 18.00 overhead

Total overhead.....$72.00

Where the 10 men worked all day on a job exactly like Job No. 1, the wages were again

80 hours × 30c = $24.00

Here, however, this job was the only one in the shop and must earn the entire $72 overhead. We have seen that under these circumstances the overhead percentage is 300%.

Overhead on Job No. 1 in this case is:

$24 × 300% = $72.00

To compare the cost under these two different conditions on this basis of overhead charging we will use all the same figures, and find we have as follows:

Job No. 1—One of Three Jobs in Shop with 30 Men Working 2 2/3 Hours Each or 80 Hours Total

Contract estimated and taken for..$125.00
Requires
1,000 lbs. steel @ 4c.....$40.00
Labor, 80 hours @ 30c..... 24.00
Overhead, $24 w. × 100% 24.00
Total 88.00
Profit ..... $ 37.00
Percentage profit..... 29.6%

Job No. 1—Only Job in Shop with 10 Men Working All Day or 80 Hours Total

Contract estimated and taken for..$125.00
Requires
1,000 lbs. steel @ 4c.....$40.00
Labor, 80 hours @ 30c..... 24.00
Overhead, $24 w. × 300% 72.00
Total 136.00
Loss ..... $ 11.00
Percentage loss..... 8.8%

It is very common practice to double productive labor to cover overhead, but from the examples shown it is plain to be seen that while that method would be safe under normal conditions, it would be entirely too low when working a smaller force.

If your productive labor remained the same at all times, your problem would be simple.

It is when depressed conditions result in a large falling off of business and with only occasional orders obtainable, which in turn demands a reduction of shop force, that troubles and mistakes occur in estimating overhead.

SOLDERING ALUMINUM

In the article telling about the aluminum roof on St. Sebastians Church in this issue, the statement is made that aluminum roofing sheets can't be soldered.

At the same time we have heard indirectly several times of sheet metal men or specialists who claim that aluminum can be soldered. We've never been able to lay our hands right on the man who can turn this trick—SO—we are printing this notice so that any reader who can solder aluminum can unload the secret.

REMEMBER—we are not talking about CAST aluminum or Utensil aluminum, but Roofing aluminum. If you want to make fame and fortune let's hear from you!

GRAVITY EXHAUST VENTILATION

The Window Sweating Problem Solved

By PAUL L. JORDAN
The Paul L. Jordan Company

IN the issue of April 26 we presented a problem in ventilating in which excess moisture or sweating of windows in a store building had been sent in for assistance by one of our readers. As the problem was received the details were as follows:

The building is on a southeast corner, the north and west sides facing intersecting streets, and being solid show windows of plate glass running from 12 inches above the floor to 24 inches below the ceiling. Above the show windows are glass fixed transoms.

These windows sweat so badly that water runs down onto the floor. That is what the owner wants to cure.

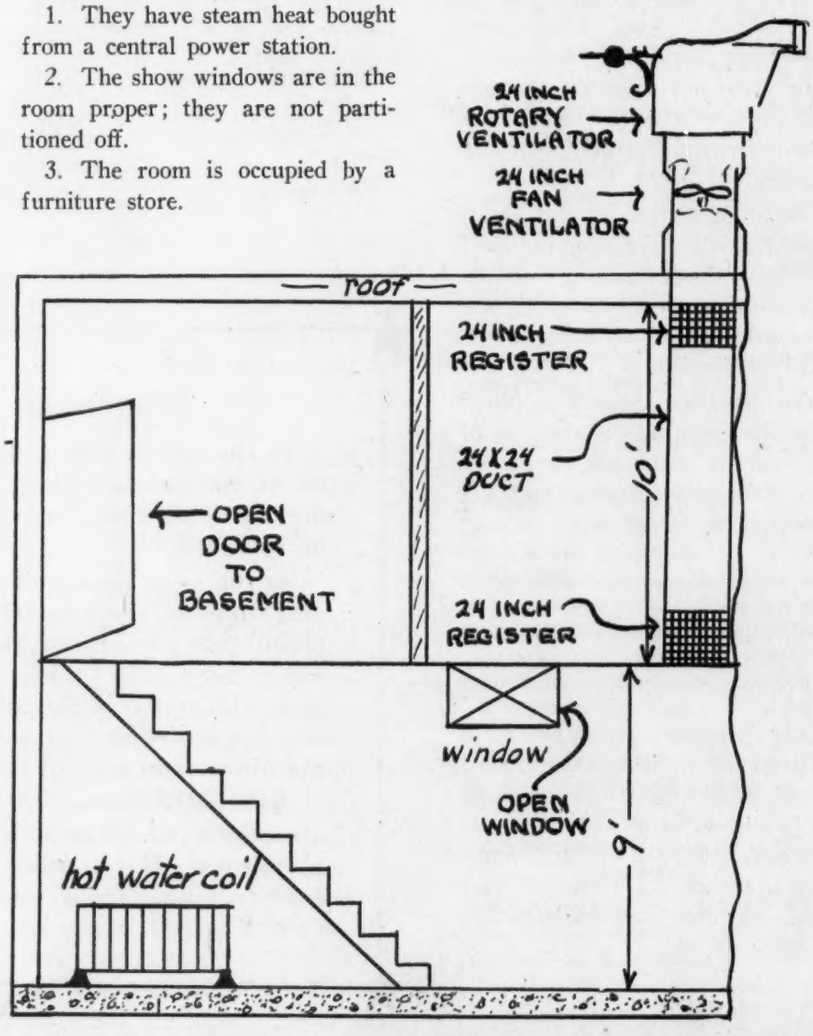
The building is one-story with basement. No roof space to amount to anything.

The owner wants to know whether or not ventilation will solve his problem. The heat is *insufficient* as it is, but there is a hot water coil in the basement from which the heat is now wasted. How will *ventilation* affect the heating? Can the waste heat from the hot water coil be used?

Before we could answer the problem we had to know more about the conditions surrounding the trouble. So we wrote the reader and asked him to send us the answers to the questions we asked. From these questions we set up the facts surrounding the problem and presented them to our readers in the issue of May 10th. We suggested that if any readers thought they could solve the problem from all the facts presented they send us in drawings or solutions which we would publish.

As a result of these questions we now publish their answers, or in other words we are doing as a good detective would—sorting out all the factors which have a bearing on the problem. Here are the anwers:

1. They have steam heat bought from a central power station.
2. The show windows are in the room proper; they are not partitioned off.
3. The room is occupied by a furniture store.
4. There seems to be nothing that throws off any moisture into the room.
5. The cellar sash can be opened.
6. The hot water coil is a cooling coil to cool the condensation before it reaches the meter.
7. There is no insulation apparent on the roof or ceiling.



This shows the heights of the basement and first floor. The stairs are enclosed on a small room on the first floor, but are open in the basement. The hot water coil is located under the stairs and its heat is now wasted. No provision is made for utilizing this heat

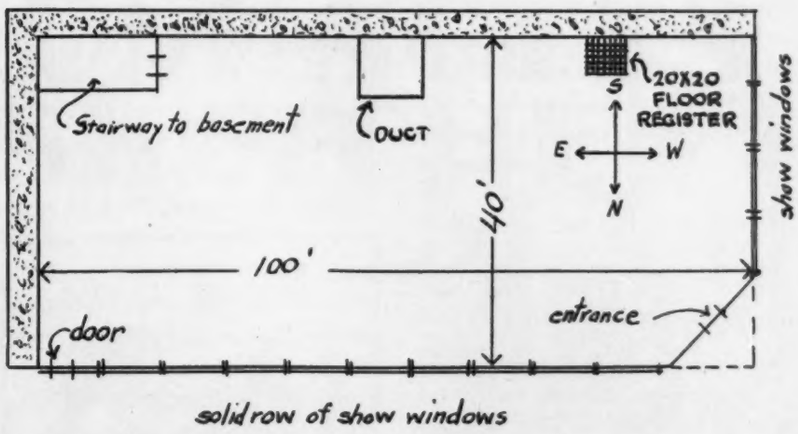
8. There is no ventilation outside of door ventilation for the ground floor and cellar sash ventilation for the basement.

9. According to a report of a heating man who took ceiling, floor and intermediate temperatures on a day showing an outside temperature of 10 degrees above zero, the floor temperature in the center of the room was 65 degrees, the ceiling temperature was 72 degrees and the intermediate temperature, taken about five feet above the floor, was 70 degrees.

10. Condensation is bad only in cool weather. The colder the weather the worse the condensation.

Now from the factors set forth Mr. Jordan has drawn his conclusions (see May 10th issue) and in this article has detailed the things he would do to remove the trouble. The solution he works out with drawings to show the changes in the building and the installation of the necessary equipment are also shown on these pages. Mr. Jordan's solution is:

"The solution of the problem lies primarily in ventilation. Effective ventilation is the getting rid of air containing undesirable substances and the replacing of that exhausted air with other air which does not contain undesirable substances. Under ordinary circumstances, the undesirable substances are those thrown off by human beings and undesirable on account of their poisonous or obnoxious qualities. In this particular case the undesirable element is moisture coming probably from human beings, but being just as undesirable if it comes from some other source. It is necessary then to get rid of this moisture through the withdrawing of the air which is laden with the moisture and replacing it with drier air.

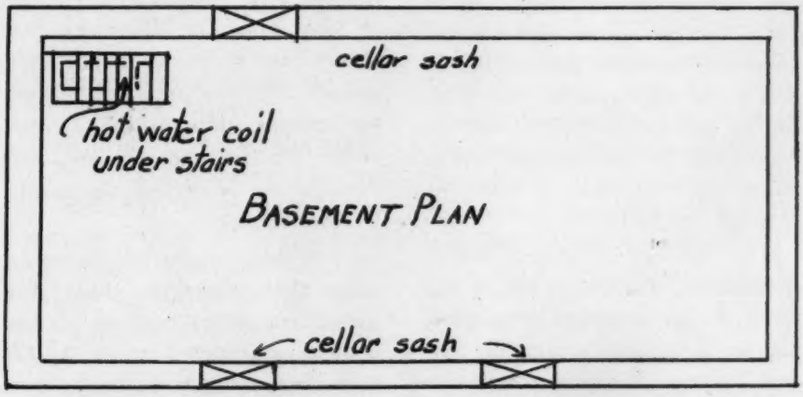


STORE FLOOR PLAN

"The easiest way to get dry air is to bring in outside air and heat it. In doing this you are not taking any moisture out of the air, but you are increasing its absorbing power so that it will hold more moisture and so absorb moisture from any moisture releasing medium. In other words, while you do not decrease the absolute humidity you do decrease the relative humidity. Air taken in at zero with a relative humidity of 100 per cent when heated to 70 degrees Fahrenheit will show a relative humidity of less than 7 per cent, and will therefore absorb fifteen times as much moisture as its original content. To eliminate these technicalities and get back to common terminology, moist air when heated becomes drier.

"By opening the cellar sash near the water coil shown in the drawing, cool air will drop down to the floor and be heated by the hot water coil before it rises to the basement ceiling. Here if can be drawn into the ground floor room either through the basement door or through floor registers opening directly into the basement. This will take care of the introduction of dry air into the ground floor room.

"Now as to the withdrawal of moist air from the ground floor room. This can only be done by air changes. There is apparently no place where this moisture congregates, but as a measure of heat conservation the flue opening should be at the floor. The air drawn from the basement will normally be fairly warm, as it will come from the basement ceiling. If the exhaust duct is placed at considerable distance from the basement door and the floor registers, then there will be little tendency for the fresh air to short cut to the duct. Inasmuch as air will come in from the outside doors to the north, as well as from the basement, I would suggest that the exhaust duct be placed against the south wall and as far



This is the floor plan of the basement. Three windows placed high above the basement floor provide light and air. The only other opening is the stair well, which is enclosed in a small room on the first floor. The hot water coil stands well under the stairs. The foundation walls are all concrete. So is the floor

west as the center.

"As to the other specifications of this duct, a good plan would be as follows: A 24 by 24-inch Celotex duct should be carried through the roof and extended to the ground floor with louvered registers both at the ceiling line and at the floor line, the top end of the duct to be capped with a 24-inch direct connected fan ventilator with a 24-inch rotary ventilator in conjunction with it.

"With the fan running this exhausting arrangement will give six changes of air per hour, and with the fan shut down it will give two changes of air per hour. The air change in this case should be kept at a minimum in order to keep down heat loss. While we are speaking of heat, this ceiling should be insulated.

"The probabilities are that without any roof space, or roof space ventilation, heat in summer, radiated down through the ceiling, is causing discomfiture. The louvered registers in the duct can be kept closed in winter and opened in the summer, which will serve to remove the heated air from underneath the ceiling. This ought to do a lot of good. With fixed transoms and no other ventilation as the store now stands, a hot air pocket, 2 feet deep at the ceiling during the summer, is bound to be present.

"During winter, when conditions are not extreme, the gravity ventilation will take care of air change. When conditions become extreme the fan can be operated an hour or two in the morning and this will overcome the condensation and will also set up a circulation of air which will help heat distribution."

A TRUE AIR CONDITIONING SYSTEM

(Continued from page 32)

The cold air, after being taken through the fan is passed through the washer and then into the furnace casing. The washer can be set to maintain any desired relative humidity in the house.

The warm air system is just as interesting as the cold air part of the layout. Most of the leads are ducts, placed up against the ceiling as can be seen in the photographs. The ducts begin in large sizes and reduce as the various leads to registers and stacks are taken off the main lines. The smoke pipe and three smaller warm air leads come off the furnace as round pipe, however.

On the plan submitted the sizes of these ducts were omitted. A hasty calculation, however, seems to indicate that the warm air end of the system is pretty well balanced with short, fat, ducts balancing long, slender, ones.

By taking the warm air off in large flat ducts much overhead pipe work was eliminated, a feature every dealer selling to the expensive house owner ought to keep in mind. Had this system been built of all round pipe there would have had to be 13 pipes taken off the furnace and taken through the basement to the various stacks and boxes.

It should be noted that every branch is equipped with a control damper. This has been found especially desirable in fan systems where the volume of air forced through any one lead has to be controlled within comparatively close limits in order that the entire system shall balance when the heat is put into the house.

A feature of the system is the use of wall outlets for the warm air. These outlets are placed 8 feet above the floor and show clearly in one of the photographs. This placing of the outlets in the wall accounts for the fact that all branch warm air leads show as taken up through the walls.

This job can be termed strictly mechanical. The coal is fed by machine, the air is washed by machine, the air is forced through the system by another machine and with automatic controls the owner has little else to do than show visitors his splendid system.

BASE FOR CHIMNEY AND HOOD

(Continued from page 35)

parallel to the line just drawn and a distance above it equal to the desired width of the collar. Draw perpendicular lines from 1 and 1 intersecting the upper horizontal line at A and A. Now from point 9 draw a perpendicular line by indefinite length. Letter the point of intersection of this line with the upper horizontal line, D. Now with D as as center and DA as a radius strike an arc intersecting the perpendicular line from point 9 at E. Through point E now draw a horizontal line of indefinite length and from points A on the collar draw perpendicular lines intersecting the horizontal line which has been drawn through point E. Next di- six equal spaces and letter them vide the distance from A to A into A, B, C, D, etc., and with A, A, D as centers and AB as radius strike arcs as shown. Add the seams as shown. Cut the metal from E to O and from the inside of the circular segments, thus completing the pattern.

FLOOR DRAFT PROBLEM

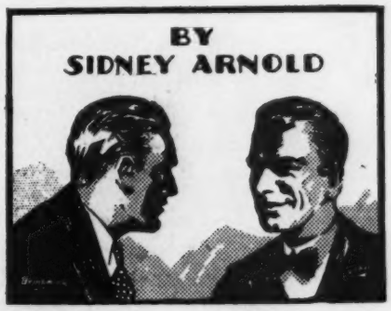
(Continued from page 27)

lost, the floor-line temperature will be raised, and the temperature at the ceiling will be lowered.

"As it stands now (without knowing the structural conditions of the house or chimney), we should have a velocity through the 16-inch cold airs of about 90 feet per minute, through the 12-inch about 125 feet per minute, and through the warm air about 135 feet per minute.

"As this suggestion from a swivel-chair strategist would give some three turnovers of the air per hour in an average house of 11,000 cubic feet, the saving of that two tons of coal should be an easy matter, as register temperature would be around 160-70 degrees."

RANDOM NOTES AND SKETCHES



We were running through eastern Indiana the other day and counted scores of metal chicken houses, most of them round, so evidently fabricated and shipped knocked down. Just why there isn't a big market on farms for the average metal man we can't figure out. All it needs is some plan for getting your story to them.

* * *

Salesmanship?

"Five gallons, please."

"Okay. How's your oil?"

"Just gas, please."

"How about a bottle of Shinyola —great for lacquer; your bus is all covered with traffic film?"

"Nope, just the gas."

"Your left rear tire's pretty well shot. Better let me put on a new one; we're selling Puncherproofs today for—"

"No, the gas will be all."

"How long since you had a grease job? Everything looks kinda dry—hear that body squeak?"

"Haven't time today—just the gas this time."

"How about one of our electric cigar lighters—clamp right on your dash and when you want a—"

"Hell, NO! JUST THE GAS!"

And as the indignant motorist drove away with his five gallons of gas, the filling station proprietor remarked to a bystander:

"That there was my barber."

* * *

This item is about an add placed in the ARTISAN announcing a shop for sale. We always hate to run these For Sale adds. They always mean another friend gone out of the industry for better or for worse. We try to console ourselves with the thought that it is for the best.

W. W. Rice of Montebello, California, writes that he advertised his shop for sale in ONE issue and got twelve replies. And still better, sold the shop. He says that's service.

* * *

We Explains Who Joe Worth, Door Bell Ringer, Is

In the May 10 issue we ran a short item on page 25 signed Joe Worth. The article had to do with the handsome returns to be gained through ringing doorbells. The item had a lot of meat in it and we have had several comments. We have been asked who Joe Worth is. Well Joe Worth is one of the men who is making Premier Warm Air Heater Company known wherever furnaces are sold. The item was a reprint from Premier Pictorial, the Premier company's house organ.

* * *

During the middle part of this week, George H. Krutzkoff, President of the Associated Sheet Metal Employers of Chicago, stopped in the office to discuss plans for the 1931 annual convention of the Illinois Sheet Metal Association.

The 1931 convention is going to be held in Chicago, which gives a fair indication of how home folks look at this wicked city. So far as we know, no thought has been given to supplying bodyguards for visitors. With plans being outlined so many months in advance, almost a year, as a matter of fact, the 1931 convention ought to go over with a bang.

* * *

The mention made of George Krutzkoff reminds us that he was accompanied by John Maier of Chicago Heights. John is one of the livest wires we have in these parts and is the same John mentioned in the Random item last issue. Any man who undertakes single-handed to give his time and effort to selling the Standard Practice book without compensation certainly deserves every bit of acclaim the industry can give him. More power to him!

* * *

In giving some of the details of the meeting of the National Association of Sheet Metal Distributors we made mention of the Raub brothers, Bill and Stuart. Just another piece of information we have on these boys. They do a jobbing business in Lancaster, Pa., and travel 60 salesmen. That's quite a business.

While reports from the meeting are rather hectic, we take it that these Raubs seduced our editorial representative into going from Niagara to some other point toward New York City by plane. The report about that time reads, Wheeee! Gulp, 'ulp, 'ulp, Ohhhh. Yes, that's really the way it came in to us, so it must have been some trip. Ordinarily our representative is a most sober-minded and industrious young man, but you never can tell about these conventions.

Perforated Metal and Wire Baskets

From R. H. Vandevelde and Company, 113 Market Street, Dyersburg, Tennessee.

We should like to know who makes perforated metal baskets, also wire baskets.

Ans.—*Perforated Metal Baskets:* Harrington and King Perforating Company, 5655 Fillmore Street, Chicago, Ill. *Wire Baskets:* Grand Rapids Wire Products Company, Grand Rapids, Michigan; Fred J. Meyers Manufacturing Company, Hamilton, Ohio, and Peerless Wire Goods Company, 6 North Michigan Avenue, Chicago, Illinois.

Tinners' Red Paint

From Young Hardware Company, Bellevue, Iowa.

Kindly advise us who makes Tinners' Red Paint for Spanish metal tile roofs.

Ans.—Wm. Conners Paint Company, Troy, New York; *Chicago Distributor:* J. L. Perkins, 140 South Dearborn Street; Industrial Division, Ohio Varnish Company, 8709 Kinsman Road, Cleveland, Ohio, and Thompson and Company, 859 West North Avenue, Pittsburgh, Pennsylvania.

"Admiral" Lawn Mower

From Walter H. Ziegler, 207 North Hackley Street, Muncie, Indiana.

Can you tell me who makes the "Admiral" lawn mower?

Ans.—The F. & N. Lawn Mower Company, Richmond, Indiana.

Used Cornice Brake 10 Gauge Capacity

From H. Sabathne and Son, 708 Eighth Avenue, Altoona, Pennsylvania.

Where can I purchase a slightly used 10 gauge and lighter capacity cornice brake, 8 to 10 feet?

Ans.—Interstate Machinery Company, 601 West Monroe Street, Chicago, have one at the present time.

Separate Blades for Fans and Blowers

From Arduini Brothers Company, 68 High Street, Worcester, Massachusetts.

Can you tell us who makes separate blades for fans and blowers?

Ans.—Acklin Stamping Company, 1926 Nebraska Avenue, Toledo, Ohio, and B. F. Sturtevant Company, Hyde Park, Boston, Massachusetts.

Dust Collecting Systems for Leather Manufacturers

From Dingler Sheet Metal Works, 774 New York Avenue, Milwaukee, Wisconsin.

Please advise us who makes dust collecting systems for leather manufacturers.

Ans.—Bayley Blower Company, 780 Greenbush Avenue, Milwaukee, Wisconsin; American Blower Company, 228 North La Salle Street; Autovent Fan and Blower Company, 1807 North Kostner Avenue; Buffalo Forge Company, 17 North Jefferson Street, of Chicago; The Brundage Company, Kalamazoo, Michigan; Alfred C. Goethel Company, 829 31st Street, Milwaukee, Wisconsin; Kirk and Blum Manufacturing Company, 2845 Spring Grove Avenue, Cincinnati, Ohio, and B. F. Sturtevant Company, Hyde Park, Boston, Massachusetts.

Adjustable Elbows, Blower Hoods and Sheet Metal Work for Thrashing Machines

From J. A. Miller, Pigeon, Michigan.

Will you please inform me who makes adjustable elbows, blower hoods, blower pipe and sheet metal work for thrashing machines?

Ans.—Chicago Metal Manufacturing Company, 3724 South Rockwell Street, Chicago.

Forms for Concrete Urns or Basins

From Chappell Plumbing and Heating Company, Chappell, Nebraska.

Who makes forms for concrete urns or basins such as are used for fountains on lawns?

Ans.—Artisan Cement Mold Works, 531 James Street, Elkhart, Indiana; Concrete Equipment Company, 535 Ottawa Avenue, Holland, Michigan; Consolidated Concrete Machinery Corporation, Adrian, Michigan, and Ornamental Mold Company, 3156 23rd Avenue, Minneapolis, Minnesota.

Used Sheet Metal Machinery

From Baker Furnace Company, 2505 Albion Street, Toledo, Ohio.

Please give me the names of firms who carry used sheet metal machinery.

Ans.—Interstate Machinery Company, 601 West Monroe Street and Maplewood Machinery Company, 2638 Fullerton Avenue, and B. L. Saltzman, 524 West Van Buren Street; all of Chicago.

Paint for Galvanized Roofing

From George R. Baker, 414 North Second Avenue, Alpena, Michigan.

Please tell me who makes a paint to be used on new galvanized roofing that will not peel or blister.

Ans.—This is "Galvanum" made by the Goheen Corporation, 331 Madison Avenue, New York City.

Metal Mail Boxes

From Carroll Plumbing and Heating Company, South Main Street, Sandwich, Illinois.

Can you give us the names of firms making metal mail boxes for private homes and places of business?

Ans.—Columbia Metal Box Company, 740 West Adams Street; Coy Manufacturing Company, 3101 South Canal Street; Nicol and Company, 228 North Jefferson Street, and Standard Electric Manufacturing Company, 941 Wrightwood Avenue; all of Chicago, and Dayton Pattern and Manufacturing Company, Dayton, Ohio.

"Robinson Heat Distributor"

From Carroll Plumbing and Heating Company, South Main Street, Sandwich, Illinois.

Who makes the furnace fan which is installed in the top of the casing directly beneath the hood?

Ans.—You refer to the Robinson Heat Distributor, which is made by The A. H. Robinson Company, Massillon, Ohio.

ASSOCIATION ACTIVITIES

Minutes of Meeting, Milwaukee Master Sheet Metal Men

The routine business of the April 2 meeting was postponed to permit Harry Rosenbloom, a local attorney, to present his plan for collection of bad accounts and general legal service and advice for association members on a contract basis. He outlined his activities with and for the members of the Milwaukee Plasterers' Association, explained his plan of collection and cited several definite cases and the results. The members asked him many questions regarding his experiences and on many varied legal questions, all of which he was able to answer to the fullest satisfaction of everyone.

An interesting discussion followed on Mr. Rosenbloom's talk with many enthusiastic comments from the members. The president appointed a committee consisting of T. E. Tonnsen, P. L. Biersach, Wm. Hammann and the secretary to draw up a letter to be sent to all members explaining the plan and soliciting their comments.

J. Bauer reported that the ventilating men were busy with both state and city code recommendations.

The secretary reported a meeting held by the furnace men working on a recommendation to include the Standard Warm Air Heating Code into the City Building Code.

T. E. Tonnsen reported the activities of the individual contractors committee in helping to defeat the adoption of the minimum wage scale on school board work.

On motion, seconded and carried, the Cream City Furnace Co., 573 National Avenue, were accepted into membership.

A. S. H. V. E. Prepares for June Meeting in Minneapolis

Minneapolis will be the scene of the American Society of Heating and Ventilating Engineers' semi-annual meeting to be held June 24 to 27. The meeting will be held in the Curtis Hotel, Tenth Street and Fourth Avenue.

A delightful program is being prepared for the membership who will attend the semi-annual meeting, as the Minnesota Chapter members have unsurpassed natural beauties to show their guests and unlimited facilities for recreation.

Subjects for discussion will be varied. One of the papers already printed is Wall Surface Temperatures, by A. C. Willard and A. P. Kratz, and among those promised are Air Conditioning—A Vital Problem in Modern Bakeries, by W. L. Fleisher; Oil Burner Research, by L. E. Seeley; Control Equipment for Gas Burning Appliances, by W. E. Stark, and Research Papers from the laboratories of the University of Wisconsin and the University of Minnesota.

The technical program is as follows:

Tuesday, June 24

Report of Committee on Meeting Programs by A. C. Willard, *chairman.*

Control Equipment for Gas Burning Appliances, by W. E. Stark.

Economic Use of Steam in Modern Buildings, by F. A. Gunther.

Report of Guide Publication Committee, by D. S. Boyden, *chairman.*

Wednesday, June 25

Report of Committee on Research, F. B. Rowley, *chairman.*

Report of Director of Research Laboratory, by F. C. Houghten.

Surface Conductances as Affected by Air Velocity and Character of Surface, by F. B. Rowley.

Wall Surface Temperatures, by A. C. Willard and A. P. Kratz.

Comfort, Wall Temperatures and Insulation, by Paul D. Close.

Thursday, June 26

Report of Committee on Oil Burning Devices, by L. E. Seeley, *chairman.*

Report of Committee on Pipe Sizes for Heating Systems, by H. M. Hart, *chairman.*

Capacity of Return Mains for Gravity and Vacuum Steam Heating Systems, by F. C. Houghten.

Loss of Head in Submerged Orifices, by F. E. Giesecke.

Friday, June 27

Air Infiltration Through Various Types of Wood Frame Building Construction, by G. L. Larson and D. W. Nelson.

Report of Committee on Garage Ventilation, by E. K. Campbell, *chairman.*

Carbon Monoxide Concentration in Garages, by A. S. Langsdorf.

Report of Committee on Air Cleaning Devices, by O. W. Armspach, *chairman.*

Air Conditioning in the Modern Bakery, by W. L. Fleisher.

Report of Committee on Air Conditions and Their Relation to Health, W. H. Carrier, *chairman.*

National Association of Sheet Metal Contractors, Fort Pitt Hotel, Pittsburgh, Pennsylvania, June 10 to 13. W. B. Markle, 336 Fourth Avenue, Pittsburgh, Secretary.

Metal Branch of the National Hardware Association, Clifton House, Niagara Falls, Ont., Can., May 16 and 17.

American Society of Heating and Ventilating Engineers, Semi-Annual Meeting, Curtis Hotel, Minneapolis, Minnesota. June 24 to 27.

NEW ITEMS *and* NEWS ITEMS
From and about the Manufacturers and Jobbers

Republic Steel Corp. Forms New Research Corporation

The formation of the Republic Research Corporation with the filing of incorporation papers at Columbus, Ohio, this week marks another step in the new Republic Steel Corporation organization. F. J. Griffiths, former board chairman of Central Alloy Steel Corporation, will head the new research unit as president. Headquarters will be made at Massillon, Ohio, where extensive facilities for steel research already exist which will be materially enlarged.

Mr. Griffiths is internationally known as an authority on special alloy steels and was largely responsible for the successful introduction to this country of the Krupp steels, Nirosta, Nitralloy and Izett. Mr. Griffiths' experience dates back to the beginning of the commercial alloy steel industry. Engaged in steel making since his sixteenth year, he supervised the first heat of chrome-vanadium steel ever made in an open hearth furnace. Many later developments in special steel practice are traceable to him. Companies under his direction have been noted for the size and scope of their research activities.

The establishment of a highly specialized research division as a separate corporation is unique, but is indicative of the importance attached by the new Republic management to the development of improved products and processes.

Payne Furnace Co. Announces New Cabinet-Type Heater

Announcement is made by the Payne Furnace & Supply Co., Inc., of Beverly Hills, California, of its entrance into the space heating field with a cabinet-type heater of new

and revolutionary design. Heretofore, this company has confined its efforts to the manufacture of gas-fired furnaces.

The new Payne offering is to be known as the Payne Console Heater and its principal distribution is to be through the gas companies and retail outlets in the home furnishings field.

The Payne Console Heater is of the warm air circulating type and is supplied in two sizes.

The exterior follows the trend in decorative design and finish as followed out in the furniture and radio fields. The finished heater looks very much like a modern piece of home or office furniture. In fact, the unusual features of its interior construction permit it to be used as such, even when it is in use as a heating device. Due to the rapid heating of the Payne multiple heating element and the employment of double wall insulation it is said that the top and sides remain so cool at all times that the heater may be used as a stand or occasional table.

"The heating element is made of rust resisting Ingot iron, welded at every seam and joint to prevent gas fumes from leaking into the warm air passages and fouling the atmosphere in the room. Circular warm air passages extend through the center of the rectangular fire-box which is baffled to insure every available heat unit being utilized before the burned products of combustion leave the heater through the vent. Fire-box and vent are constructed to provide perfect combustion at all times.

"The heating element is surrounded by a galvanized outer casing. A specially constructed hood over the top of the heating element directs the heat out through an open grille at the top of the front wall of the heater. Between the outer casing and the outer walls of the cabinet is another air space which keeps the heating element from warming up the outer side walls of the heater.

"The smooth, flat top is removable and is heavily insulated.

Quality identified at a glance— *by the Chase-Mark*

YOU can't see copper quality. But you can know when a product has it. Chase Copper is of the highest quality... is full weight copper of honest gauge.

The Chase-Mark is your guarantee. It is on every length of Chase Gutters and Downspouts. It is as good as our bond that these products will be satisfactory to your customers... soft roll copper, flat strip copper, and copper roofing accessories—all are 16 oz. copper tested and guaranteed.

Let the nearest of our 18 Chase Warehouses serve you. On emergency orders you will get the quickest kind of cooperation. No delays here.

Remember
Chase Copper Nails will make the job rustless throughout.

CHASE COPPER LEADERS ▲ GUTTERS ▲ FLASHINGS

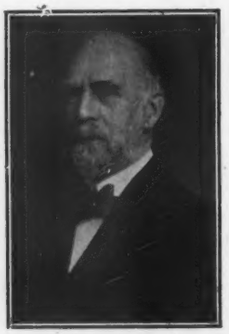
A PRODUCT OF CHASE BRASS & COPPER CO.—Incorporated—Waterbury, Conn.

WAREHOUSES—New York . . . Boston . . . Newark . . . Philadelphia . . . Baltimore . . . Cincinnati . . . Cleveland Detroit . . . Chicago . . . St. Louis . . . New Orleans . . . Los Angeles . . . San Francisco . . . Buffalo Milwaukee . . . Minneapolis . . . Seattle . . . Oakland . . . (Also Branch Offices in Pittsburgh and Dallas.) Canadian Rep.: W. E. Booth Co., Ltd., Toronto, Ontario. Mills and Home Office, Waterbury, Conn.

Silas Tuttle of Tuttle and Bailey Dies at Age of 91

Mr. Silas Tuttle of the well-known firm of Tuttle & Bailey Mfg. Co., died at his Brooklyn home on May 5th, 1930, in the ninety-first year of his age.

Mr. Tuttle was born in the little town of Whippany, N. J., and in early life learned the trade of watchmaker and jeweler and entered into business in the present jewelry district of lower Manhat-



tan. He left this occupation in 1866 to join his brothers, William and Edward and J. S. Bailey in the firm of Tuttle & Bailey Mfg. Co. which succeeded an earlier co-partnership of Tuttle & Cowley in which his brother Charles was a partner.

From 1876, Mr. Tuttle was in charge of all manufacturing operations at the Brooklyn plant and to him were due some of the basic patents and improvements in the manufacture and operation of warm air registers. Mr. Tuttle was president of the company for 26 years, from 1875 to 1921 and then chairman of the Board of Directors, holding this position at the time of his death.

He was deeply interested in politics and all civic and national welfare movements and served the old city of Brooklyn as a member of the Board of Supervisors before the city was consolidated as a part of Greater New York. He was a member of the advisory board of one of our prominent financial institutions, a member of the Society of Old Brooklynites and one of the founders and charter members of the Apollo Club.

Mr. Tuttle is survived by his widow, all of his seven children and a number of grandchildren and great grandchildren.

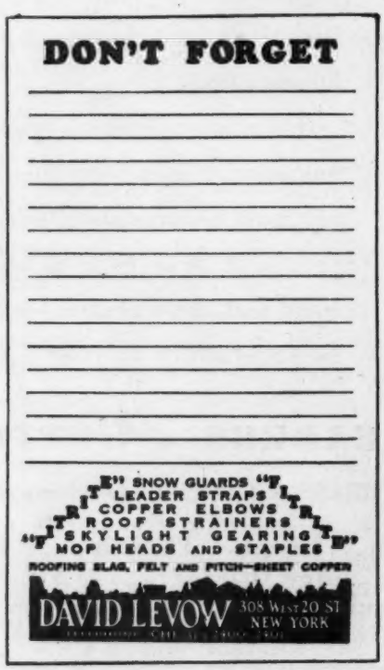
Levow of New York Uses a Reminder Card

David Levow of New York City uses a small reminder sheet to keep his name before the men and firms he sells to. This reminder is really a pad of memoranda sheets glued together on a cardboard back which is printed as a return mailing card. This card makes it easy for the receiver to acknowledge receipt of the sheets and order more.

At the bottom of the sheet a list shows the various products made by Mr. Levow. In addition the name, address and phone number are plainly shown.

These blanks are sent to all customers with the idea that when ordering time comes the name of the manufacturer and a means of getting hold of him quickly will be right in front of the customer's eyes.

These sheets have shown themselves to be good business getters.



Lutz of Brooklyn Makes Funeral Urns of Monel

Several advantages are claimed for this funeral urn, made by a Joseph H. Lutz, a sheet metal worker of Brooklyn, N. Y. It was manufactured entirely from monel metal sheet, a rustless nickel copper

alloy, with the exception of the handles, which were fashioned from monel metal strip soldered together. The meal has a high lustre that keeps its brightness with but little attention. It is immune to the action of salt and fresh water and alkalis and highly resistant to acid corrosion and abrasion.

Mrs. G. L. Steinfield, Old Employee of John Maier & Co., Dies

Mrs. G. L. Steinfield, a secretary for John Maier & Co., Chicago, for the past 19 years, died a few days ago in Chicago.

Mrs. Steinfield's many friends in the sheet metal trade in and around Chicago will be saddened to hear of her death. AMERICAN ARTISAN joins with the friends in mourning the passing of a well-liked and esteemed friend.

QUALITY METAL...

plus a reputation for good work

has CLOSED many a CONTRACT

F. & R. Lazarus Company Building, Columbus, Ohio. A four-foot Anaconda Copper cornice fabricated and installed by Phil Kromer & Sons, of Columbus.

Left:
A residence in Winnetka, Ill. Sheet metal work of Anaconda Copper by the Millen Hardware Co., Wilmette, Ill.

Below:
Bell Telephone Building, Kansas City, Mo., Anaconda Copper work fabricated and installed by the Kornbrodt Kornice Kompany of Kansas City.

3,500 pounds of Anaconda Copper installed on this house, by the George A. Barnard Co., of Worcester, Mass.

Below:
23,000 pounds of Anaconda Copper used in this job—Idlewild Presbyterian Church, Memphis, Tenn. Installed by Jake Dermon.

Prominent sheet metal contractors find that by recommending Anaconda Copper they can often get away from competitive, cut-price bidding, and are reasonably sure of getting the job—at a profit.

This condition is brought about by the public's realization that the best materials often cost least in the long run . . . that money spent for rust-proof construction today is saved tomorrow.

Your selling job is simplified. Most people know the advantages of copper sheet metal work—most of them buy today on the basis of "value" instead of "price." And when it comes to sheet metal work, it pays you to recommend and install Anaconda Sheet Copper. It is known by name to home-owners, architects and builders.

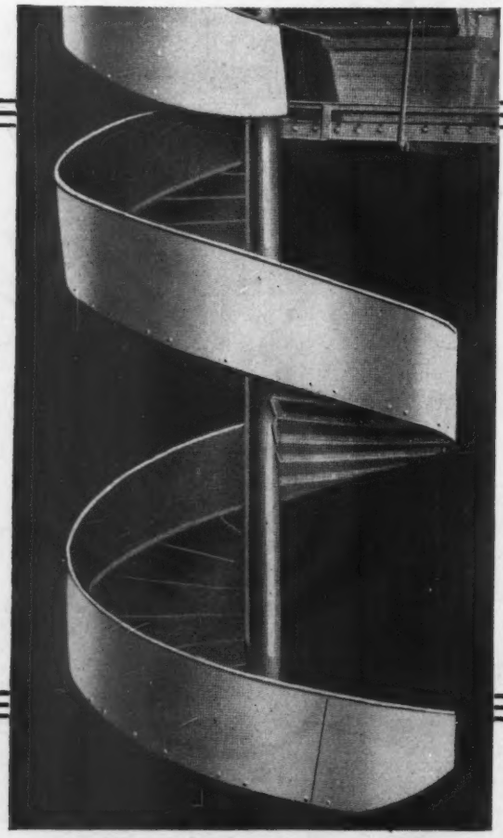
Anaconda Copper is uniform in temper, accurately gauged and forms up easily in the brake. Trade-marked sheets, rolls and Economy Strips are stocked by leading distributors. The American Brass Company, General Offices, Waterbury, Connecticut.

ANACONDA

Sheet Metal Work of

ANACONDA COPPER

Look for the name ANACONDA in every sheet and strip. Leading Supply Houses carry it



INLAND OPEN-HEARTH STEEL

Choose your most important raw material carefully . . . .

INLAND COPPER-ALLOY STEEL

TO the foundation of raw material you add your work, experience, skill. Without a good foundation . . . raw material carefully selected to fit the need exactly . . . good work may soon be forgotten. A job which could have been a recommendation to you may become a reflection to live down.

Save with Steel

By standardizing on Inland Open Hearth Sheet Steel you can be sure the exact grade you need is promptly available . . . and that every sheet in the lot will be as uniform as long experience and continual research can make sheet steel.

Examples of special grade sheets for specific purposes are Inland Ventilating Stock, Inland Galvanized Tight Coated for use where considerable bending and forming are necessary, and Inland Copper-Alloy Steel, the longest lived and lowest cost type of rust-resisting sheets made.

Write for complete information.

INLAND STEEL COMPANY

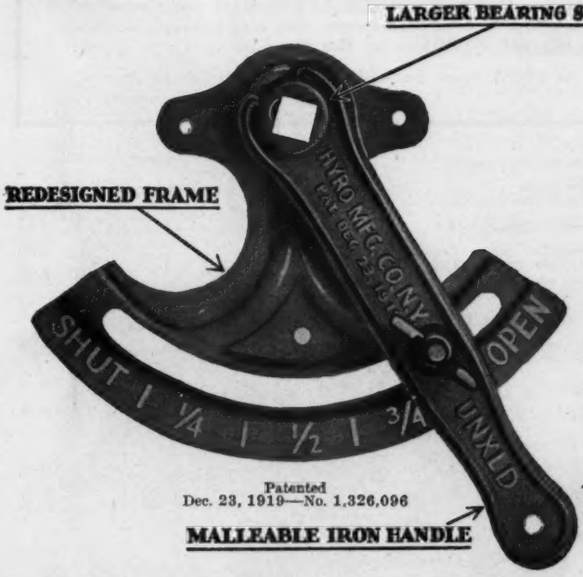
Sheets
Bars
Plates
Structurals

ABLE SERVANT OF THE CENTRAL WEST

Rails
Track Accessories
Rivets
Billets

38 SOUTH DEARBORN STREET, CHICAGO

The Improved Hyro "UNXLD" Damper Quadrant



A New Quadrant for regulating dampers in hot and cold air ducts, blower systems, etc., with these improvements:

LARGER BEARING SURFACE. The new type quadrant provides a much larger bearing surface for the rod, eliminating the possibility of the rod slipping out, and also does away with the objectionable rattling of the damper.

MALLEABLE IRON HANDLE. The handle of the new quadrant is made of malleable iron. It is more rigid than the old handle and makes a much neater installation.

REDESIGNED FRAME. The frame of the ⅜" quadrant is smaller than that of the old model. This size was determined to be the most practical for regulating dampers that require a ⅜" quadrant. The frame of the ½" quadrant will remain the same size.

HYRO DIAL DAMPER REGULATOR

Patented Dec. 9, 1919
No. 1,324,620

Here is another practical and efficient device for regulating small and medium size dampers in hot and cold air ducts, blow pipes, etc. It was designed to meet the demand for a less costly damper regulator than our "Unxld" Damper Quadrant.

The Hyro Dial Damper Regulator is of very simple construction. It is easily and quickly attached to either curved or flat surfaces. It requires only two bolts or rivets to hold it absolutely rigid.

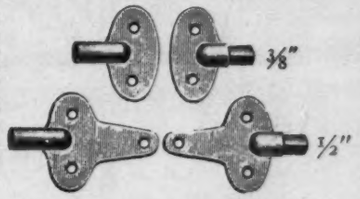
The graduated dial shows at a glance the exact position of the damper in the duct.

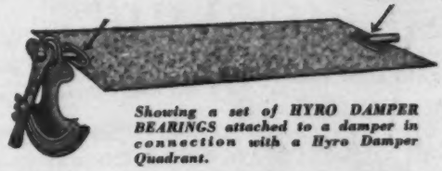
When tightened, the wing-nut locks the damper in the desired position, giving absolute control of the passage of air.

Made of steel to fit ⅜" square rod or Hyro Damper Bearings. Furnished in an electro-galvanized finish only.

HYRO DAMPER BEARINGS

Used instead of rods on small and medium size dampers. Quickly attached. Made in two sizes—⅜" to fit ¾" Damper Quadrants or Dial Damper Regulators and ½" to fit ½" Damper Quadrants. Furnished in galvanized finish only.





Showing a set of HYRO DAMPER BEARINGS attached to a damper in connection with a Hyro Damper Quadrant.

HYRO DAMPER ROD CLIP

Patented April 4, 1922
No. 1,411,945

Offers a quick and easy means of fastening square rod to dampers.

Easy, because the rod is fastened firmly to the damper without driling—and consequent weakening of the rod. And quick, because the drilling operation is eliminated. Made for the following sizes of square rod: ¾", ½", ⅝", ¾" and ⅞". Furnished in galvanized finish only.

Showing a rod attached to a damper by two HYRO DAMPER ROD CLIPS in connection with a Hyro Damper Quadrant.

Other HYRO Time-and-Labor Saving DAMPER ACCESSORIES

HYRO MANUFACTURING COMPANY, Inc.

202 VARICK STREET **NEW YORK**

~ MARKET QUOTATIONS ~

AMERICAN ARTISAN is the only publication quoting Prices on Metals, Sheet Metal Equipment and Supplies, Warm Air Heating Supplies and Accessories, corrected bi-weekly. These quotations are not guaranteed but are obtained from reliable sources and reflect nation-wide market conditions at the time of going to press.

NOTE—These prices are Chicago Warehouse Prices to which must be added territory differentials

METALS

PIG IRON

Chicago Fdy., No. 2	$19.00
Southern Fdy. No. 2, 18.20 to	19.01
Lake Superior Charcoal	23.04 to 27.04
Malleable	19.00

FIRST QUALITY BRIGHT CHARCOAL TIN PLATES

IC	20x28 112 sheets	$22.50
IX	20x28	25.50
IXX	20x28 56 sheets	14.50
IXXX	20x28	15.50
IXXXX	20x28	17.00

TERNE PLATES

	Per Box
IC 20x28, 40-lb. 112 sheets	$25.00
IX 20x28, 40-lb. 112 sheets	27.75
IC 20x28, 25-lb. 112 sheets	21.15
IX 20x28, 25-lb. 112 sheets	23.80
IC 20x28, 20-lb. 112 sheets	19.55
IV 20x28, 20-lb. 112 sheets	22.05

"ARMCO" INGOT IRON PLATES

No. 8 ga.—110 lbs.	$4.15
3/16 in.—100 lbs.	4.05
¼ in.—100 lbs.	3.85

COKE PLATES

Cokes, 80 lbs., base, 20x28	$12.00
Cokes, 90 lbs., base, 20x28	12.20
Cokes, 100 lbs., base, 20x28	13.75
Cokes, 107 lbs., base, IC, 20x28	12.75
Cokes, 135 lbs., base, IX, 20x28	14.75
Cokes, 155 lbs., base, 2X, 56 sheets	8.50
Cokes, 175 lbs., base, 3X, 56 sheets	9.35
Cokes, 195 lbs., base, 4X, 56 sheets	10.25

BLUE ANNEALED SHEETS

Base 10 ga.	per 100 lbs.	$3.35
"Armco" 10 ga.	per 100 lbs.	4.15

ONE PASS COLD ROLLED BLACK

No. 18-20	per 100 lbs.	$3.85
No. 22	per 100 lbs.	4.00
No. 24	per 100 lbs.	4.05
No. 26	per 100 lbs.	4.15
No. 27	per 100 lbs.	4.20
No. 28	per 100 lbs.	4.30

GALVANIZED

No. 16	per 100 lbs.	$4.10
No. 18	per 100 lbs.	4.20
No. 20	per 100 lbs.	4.40
No. 22	per 100 lbs.	4.45
(Standard differentials on extras to apply)		
No. 24	per 100 lbs.	$4.60
No. 26	per 100 lbs.	4.85
No. 27	per 100 lbs.	4.95
No. 28	per 100 lbs.	5.10
"Armco" 24	per 100 lbs.	6.15

BAR SOLDER

Warranted 50-50	per 100 lbs.	$22.50
45-55	per 100 lbs.	21.50
48-52	per 100 lbs.	20.50
Plumbers'	per 100 lbs.	18.00

ZINC

In Slabs $5.50

SHEET ZINC

Cask Lots (600 lbs.)	$12.00
Sheet Lots (100 lbs.)	13.00

BRASS

Sheets, Chicago base	19 ¾ c
Tubing, brazed, Chicago base	27 ¼ c
Tubing, seamless, Chicago base	24 ¾ c
Wire, Chicago base	20 ¼ c
Rods, Chicago base	18 ¼ c

COPPER

Sheets, Chicago base	22 ¾ c
Tubing, seamless, Chicago base	25 c
Wire, plain rd., 8 B. & S. Ga. and heavier	15 c

LEAD

American Pig	$6.50
Bar	8.50

TIN

Bar Tin	per 100 lbs.	$39.00
Pig Tin	per 100 lbs.	38.00

SHEET METAL SUPPLIES, WARM AIR FURNACE FITTINGS AND ACCESSORIES

ASBESTOS

Paper up to 1/16	6c per lb.
Roll board	7 ½ c per lb.
Mill board 3/32 to ⅛	7 ½ c per lb.
Corrugated paper (250 sq. ft. per roll)	$6.00 per roll

ASBESTOS SEGMENTS

8 in.	per 100 sets	$7.30
9 in.	per 100 sets	8.30
10 in.	per 100 sets	9.30
12 in.	per 100 sets	10.50

CEMENT FURNACE

American Seal, 5-lb. cans, net		$0.40
American Seal, 10-lb. cans, net		0.80
American Seal, 25-lb. cans, net		2.00
Pecora	per 100 lbs.	7.50

CLIPS

Damper

No-Rvet Steel, with tail pieces, per gross	$9.50
Rivet Steel, with tail pieces, per gross	7.50
Tail pieces, per gross	2.40

COPPER FOOTING

Copper Footing ..... 34 %

CORNICE BRAKES

Chicago Steel Bending

Nos. 1 to 6B ..... Net

CUT-OFFS

Cal., plain, round or cor. rd.

26 gauge	30 %
28 gauge	35 %

DAMPERS

Yankee Hot Air

7 inch,	doz.	$1.60
8 inch,	doz.	2.20
9 inch,	doz.	2.60
10 inch,	doz.	2.80
12 inch,	doz.	3.50
14 inch,	doz.	5.00

EAVES TROUGH

Galv. Crimpedge, crated	75-10 %
Zinc, "Barnes"	60 %

ELBOWS

Conductor Pipe

Galv. plain or corrugated, round flat Crimp.

28 gauge	60 %
26 gauge	45 %
24 gauge	15 %

Galv. Terne Steel

Plain Rd. and Rd. Corr.

28 gauge	60 %
26 gauge	45 %
24 gauge	15 %

Square Corrugated

28 gauge	50 %
26 gauge	35 %

Portico Elbows

Standard Gauge Conductor Pipe, plain or corrugated.

Not nested	70 & 5 %
Nested solid	70 & 5 %

Sq. Corr., A. & B. & Octagon

28 gauge	50 %
26 gauge	35 %

Portico

1, 1¼, 1½ inch ..... 45 %

Copper

16 oz. all designs ..... 45 %

Zinc

All styles ..... 60 %

ELBOWS—Stove Pipe

1-piece Corrugated, Uniform Blue "Milcor" No. 28 Gauge.	Doz.
5 inch	$1.15
6 inch	1.26
7 inch	1.75

Special Corrugated

6 inch	$1.00
7 inch	1.60

Adjustable—Uniform Blue

"Milcor" No. 28 Gauge, Uniform Blue.

5 inch	$1.60
6 inch	1.75
7 inch	2.10

WOOD FACES—60 % off list.

FIRE POTS

Geo. W. Diener Mfg. Co.	Each
No. 02 Gasoline Torch, 1 qt.	$5.18
No. 9250, Kerosene, or Gasoline Torch, 1 qt.	6.50
No. 10 Tinner's Furnace Square tank, 1 gal.	11.20
No. 15 Tinner's Furnace Round tank, 1 gal.	10.70
No. 21 Gas Soldering Furnace	8.00
No. 110 Automatic Gas Soldering Furnace	10.50

GLASS

Single and Double Strength, A, all brackets	85 %
Single and Double Strength, B, all brackets	87 %

HANGERS

Conductor Pipe

Milcor Perfection Wire	25 %
Milcor Triplex Wire	10 %

Eaves Trough

Milcor Steel (galv. after forming) from list	45 %
Milcor Selflock E. T. Wire, List	10 %

HOOKS

Conductor

"Direct Drive" Wrought Iron for wood or brick ..... 15 %

MITRES

Galvanized Steel Mitres

28 gauge	70
26 gauge	60-20

PASTE

Asbestos Dry Paste

200-lb. barrel	$15.00
100-lb. barrel	7.75
50-lb. pail	4.50
25-lb. pail	2.50
10-lb. bag	1.20
5-lb. bag	0.60

PIPE

Galvanized

Crated and nested (all gauges)	75-7 ½ %
Crated and not nested (all gauges)	75-2 ½ %

Furnace Pipe

Double Wall Pipe and Fittings	60 %
Single Wall Pipe, Round Galvanized Pipe	60 %
Galvanized and Tin Fittings	60 %

Lead

Per 100 lbs. $12.50

Stove Pipe

"Milcor" "Titelock" Uniform Blue Stove

28 gauge, 5 inch U. C. nested	$11.00
28 gauge, 6 inch U. C. nested	12.00
28 gauge, 7 inch U. C. nested	14.00
30 gauge, 5 inch U. C. nested	10.25
30 gauge, 6 inch U. C. nested	11.00
30 gauge, 7 inch U. C. nested	13.00

T-Joint Made Up

6 inch, 28 ga. ..... per doz. $3.40

REGISTERS AND FACES

Floor Registers

Except Cast Iron	40 & 10 %
Cast Iron	20 %

Baseboard

2-Piece	40 & 10 %
1-Piece	40-10 & 20 %

Adjustable Ventilators

Adjustable Cold Air Faces	40 & 10 %
Adjustable Ventilators	40 & 10 %

RIDGE ROLL

Galv. Plain Ridge Roll, b'dld	75-15-5 %
Galv., Plain Ridge Roll, crated	75-15 %

SCREWS

Sheet Metal

7, ½ x ¼,	per gross	$0.52
No. 10,	¾ x 3/16, per gross	0.68
No. 14,	⅞ x ¼, per gross	0.88

SHEARS, TINNERS' AND MACHINISTS'

Viking $22.00

Lennox Throatless

No. 18	35 %
Shear blades (f. o. b. Marshalltown, Iowa.)	10 %

SHOES

Galv. 28 Gauge, Plain or Corrugated, round flat crimp	60 %
26 gauge, round flat crimp	45 %
24 gauge, round flat crimp	15 %

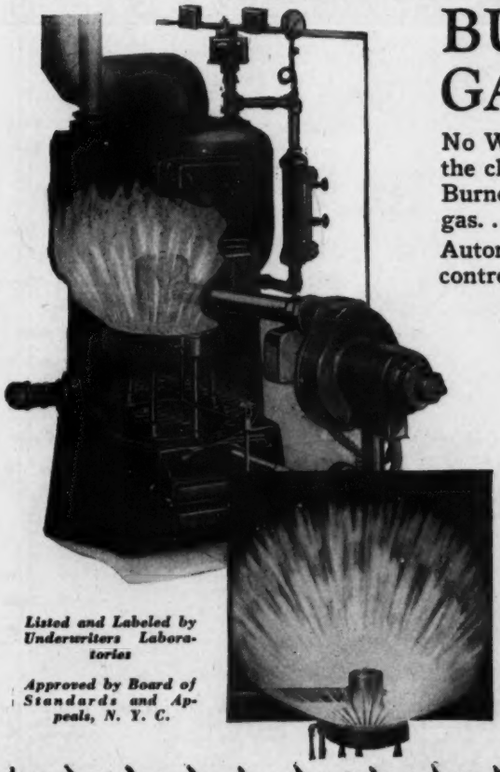
SNIPS, TINNERS'

Milcor ..... Net

VENTILATORS

Standard	30 to 40 %
Milcor	Net

A WINNER wherever shown . . this amazing OIL BURNER that turns OIL to GAS . . . then burns the GAS . . .



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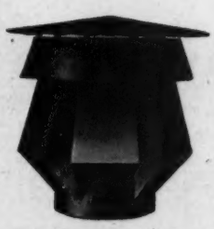

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Lakeside Co., Hermansville, Mich.

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Lamson & Sessions Co., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Brakes—Bending
Dreis & Krump Mfg. Co., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Brakes—Cornice
Dreis & Krump Mfg. Co., Chicago, Ill.

Brass and Copper
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Copper & Brass Research Association, New York, N. Y.
Revere Copper & Brass, Rome, N. Y.

Bronze
Revere Copper & Brass, Rome, N. Y.

Cans—Garbage
Diener Mfg. Co., G. W., Chicago, Ill.
Osborn Co., The J. M. & L. A., Cleveland, Ohio

Castings—Malleable
Fanner Mfg. Co., Cleveland, Ohio

Ceilings—Metal
Eller Manufacturing Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Chaplets
Fanner Mfg. Co., Cleveland, Ohio

Cleaners—Vacuum
Brillion Furnace Co., Brillion, Wis.
National Super Service Co., Toledo, Ohio

Copper
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Revere Copper & Brass, Rome, N. Y.
Rockford Sheet Steel Co., Rockford, Ill.

Cornices
Eller Manufacturing Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Cut-offs—Rain Water
Eller Manufacturing Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Dampers—Quadrants—Accessories
Eller Mfg. Co., Canton, Ohio
Hart & Cooley Co., Holland, Mich.
Howes Co., S. M., Boston, Mass.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Parker-Kalon Corp., New York, N. Y.

Dampproofings
Lastik Products Corp., Pittsburgh, Pa.

Damper Regulators
Sheer Co., H. M., Quincy, Ill.

Diffuser—Air Duct
Aeolus-Dickinson Co., Chicago, Ill.

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J. M. & L. A. Osborn Co., Cleveland, Ohio

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Dustless Ash Co., Muskegon, Mich.

Eaves Trough
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Berger Bros. Co., Philadelphia, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Rockford Sheet Steel Co., Rockford, Ill.

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Barnes Metal Products Co., Chicago, Ill.
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Rockford Sheet Steel Co., Rockford, Ill.

Fittings—Conductor
Barnes Metal Products Co., Chicago, Ill.
Braden Mfg. Co., Terre Haute, Ind.
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Flue Thimbles
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Fluxes—Soldering
Kester Soldering Co., Chicago, Ill.

Furnace Cement
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Eller Mfg. Co., Canton, Ohio
Lastik Products Corp., Pittsburgh, Pa.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Furnace Cement—Liquid
Technical Products Co., Pittsburgh, Pa.

Furnace Chain
Hart & Cooley Co., Holland, Mich.

Furnace Cleaners—Suction
Brillion Furnace Co., Brillion, Wis.
National Super Service Co., Toledo, Ohio

Furnace Fans
Brundage Co., The, Kalamazoo, Mich.
Lakeside Co., Hermansville, Mich.
Robinson Co., A. H., Massillon, Ohio

Furnace Paste
Larsen-Bennett Co., Omaha, Neb.

Furnace Pokers
Fanner Mfg. Co. Cleveland, Ohio

Furnace Pulleys
Hart & Cooley Co., Holland, Mich.

Furnace Regulators
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Sheer Co., H. M., Quincy, Ill.
White Mfg. Co., Minneapolis, Minn.

Furnace Rings
Eller Mfg. Co., Canton, Ohio
Forest City-Walworth Run Foundries Co., Cleveland, Ohio
Milwaukee Corrugating Co., Milwaukee, Wis.

Furnace Switch—Automatic
Payne Furnace & Supply Co., Beverly Hills, Cal.
Robinson Co., A. H., Massillon, Ohio

Furnaces—Gas
Payne Furnace & Supply Co., Beverly Hills, Cal.
Robinson Co., A. H., Massillon, Ohio
Rudy Furnace Co., Dowagiac, Mich.
Wise Furnace Co., Akron, Ohio

Furnaces—Warm Air
Agricola Furnace Co., Gadsden, Ala.
American Furnace Co., St. Louis, Mo.
Brillion Furnace Co., Brillion, Wis.
Farris Furnace Co., Springfield, Ill.
Forest City-Walworth Run Fdy., Cleveland, Ohio
Fox Furnace Co., Elyria, Ohio
Henry Furnace & Fdy. Co., Cleveland, Ohio
Hess Warming & Ventilating Co., Chicago, Ill.
Langenberg Mfg. Co., St. Louis, Mo.
London Furnace Co., London, Ohio
Lennox Furnace Co., Marshalltown, Iowa
Syracuse, N. Y.
May Fiebeger Furnace Co., Newark, Ohio
Meyer Furnace Co., The, Peoria, Ill.
Midland Furnace Co., Columbus, Ohio
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Payne Furnace & Supply Co., Beverly Hills, Cal.
Premier Warm Air Heater Co., Dowagiac, Mich.
Peerless Foundry Co., Indianapolis, Ind.
Richardson & Boynton Co., New York, N. Y.
Robinson Co., A. H., Massillon, Ohio
Rudy Furnace Co., Dowagiac, Mich.
Standard Fdy. & Furnace Co., De Kalb, Ill.
Success Heater Mfg. Co., Des Moines, Iowa
Schwab & Sons Co., R. J., Milwaukee, Wis.
Waterman-Waterbury Co., Minneapolis, Minn.
Western Steel Products Co., Duluth, Minn.
Wise Furnace Co., Akron, Ohio

Gas Burning Attachments
Munkel-Rippel Heating Co., Columbus, Ohio

Grilles
Auer Register Co., Cleveland, Ohio
Harrington & King Perforating Co., Chicago, Ill.
Hart & Cooley Co., New Britain, Conn.
Independent Register & Mfg. Co., Cleveland, Ohio

Guards—Machine and Belt
Harrington & King Perforating Co., Chicago, Ill.

Handles—Boiler
Berger Bros. Co., Philadelphia, Pa.

Handles—Soldering Iron
Hyro Mfg. Co., New York, N. Y.

Handles—Furnace Door
Fanner Mfg. Co., Cleveland, Ohio

Hangers—Eaves Trough
Berger Bros. Co., Philadelphia, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Heat Regulation Systems
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Sheer Co., H. M., Quincy, Ill.
White Mfg. Co., Minneapolis, Minn.

Heaters—Cabinet
Fox Furnace Co., Elyria, Ohio
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Waterman-Waterbury Co., Minneapolis, Minn.

Heaters—Combination Water
Alamo Heater Co., Chicago, Ill.
Standard Fdy. & Furnace Co., De Kalb, Ill.

Heaters—Domestic Hot Water
Alamo Heater Co., Chicago, Ill.
Standard Fdy. & Furnace Co., De Kalb, Ill.

Heaters—School Room
Meyer Furnace Co., The, Peoria, Ill.
Western Steel Products Co., Duluth, Minn.
Waterman-Waterbury Co., Minneapolis, Minn.

Humidifiers
Diener Mfg. Co., G. W., Chicago, Ill.
Meyer & Bro. Co., F., Peoria, Ill.
Sheer Co., H. M., Quincy, Ill.

Lath—Expanding Metal
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Machines—Crimping
Bertsch & Co., Cambridge City, Ind.

Machinery—Culvert
Bertsch & Co., Cambridge City, Ind.

Machines—Tinsmith's
Bertsch & Co., Cambridge City, Ind.
Dreis & Krump Mfg. Co., Chicago, Ill.
Hyro Mfg. Co., New York, N. Y.
Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
Whitney Mfg. Co., W. A., Rockford, Ill.

Metals—Perforated
Harrington & King Perforating Co., Chicago, Ill.

Miters
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Miters—Eaves Trough
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Braden Mfg. Co., Terre Haute, Ind.
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Nails—Copper and Brass
Chase Brass & Copper Co., Waterbury, Conn.
Revere Copper & Brass, Rome, N. Y.

(Continued on page 54)

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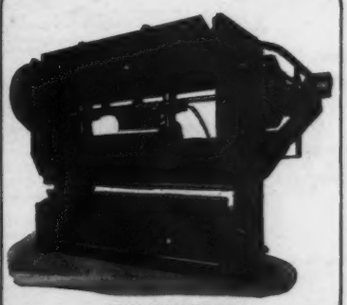

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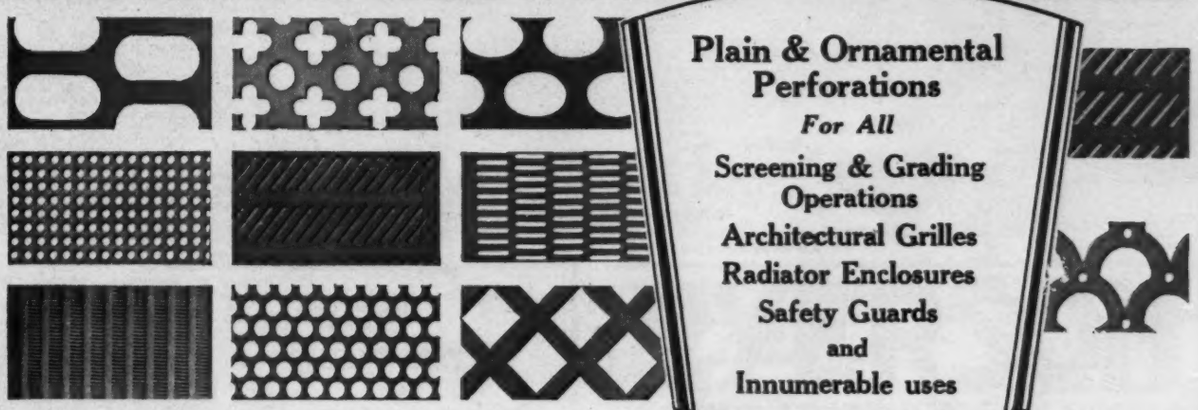

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BUYERS' DIRECTORY

(Continued from page 52)

Nails—Hardened Masonry

Parker-Kalon Corp., New York, N. Y.

Oil Burners

Crystal Oil Burner Corp., New York, N. Y.
McIlvaine Burner Corp., Evanston, Ill.

Ornaments—Sheet Metal

Eller Mfg. Co. Canton, Ohio
Miller & Doing, Inc., Brooklyn, N. Y.
Milwaukee Corrugating Co., Mil., Chgo., LaCrosse, Kan. City

Paint

Connors Paint Mfg. Co., Wm., Troy, N. Y.

Perforated Metals

Harrington & King Perforating Co., Chicago, Ill.

Pipe and Fittings—Furnace

Eller Mfg. Co. Canton, Ohio
Henry Furnace & Fdy. Co., Cleveland, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milwaukee Corrugating Co., Mil., Chgo., LaCrosse, Kan. City
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Peerless Foundry Co., Indianapolis, Ind.

Pipe and Fittings—Stove

Meyer & Bro. Co., F., Peoria, Ill.
Milwaukee Corrugating Co., Mil., Chgo., LaCrosse, Kan. City

Pipe—Conductor

Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., LaCrosse, Kan. City

Punches

Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
W. A. Whitney Mfg. Co., Rockford, Ill.

Punches—Combination Bench and Hand

Hyro Mfg. Co., New York, N. Y.

Punches—Hand

Hyro Mfg. Co., New York, N. Y.
W. A. Whitney Mfg. Co., Rockford, Ill.

Putty—Stove

Connors Paint Mfg. Co., Wm., Troy, N. Y.

Radiator Cabinets

Hart & Cooley Co., Holland, Mich.

Ranges—Gas

Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Richardson & Boynton Co., New York, N. Y.

Registers—Warm Air

Auer Register Co., Cleveland, Ohio
Eller Mfg. Co., Canton, Ohio
Forest City-Walworth Run Foundries Co. Cleveland, Ohio
Hart & Cooley Co., Holland, Mich.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Independent Register & Mfg. Co., Cleveland, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milwaukee Corrugating Co., Mil., Chgo., LaCrosse, Kan. City
Rock Island Register Co., Rock Island, Ill.
Symonds Register Co., St. Louis, Mo.

Registers—Wood

American Wood Register Co., Plymouth, Ind.
Auer Register Co., Cleveland, Ohio
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., LaCrosse, Kan. City

Regulators—Heat

Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
H. M. Sheer Co. Chicago, Ill.
White Mfg. Co., Minneapolis, Minn.

Ridging

American Rolling Mill Co., Middletown, Ohio
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., LaCrosse, Kan. City

Rivets—Stove

Lamson & Sessions Co., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Rods—Stove

Lamson & Sessions Co., Cleveland, Ohio

Rolls—Forming

Bertsch & Co., Cambridge City, Ind.

Roofing Cement

Connors Paint Mfg. Co., Wm., Troy, N. Y.
Lastik Products Corp., Pittsburgh, Pa.

Roof Paints

Lastik Products Corp., Pittsburgh, Pa.

Roof—Flashing

Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Milwaukee, Wis.

Roofing—Iron and Steel

American Rolling Mill Co., Middletown, Ohio
Central Alloy Division, Republic Steel Corp., Youngstown, Ohio
Eller Mfg. Co., Canton, Ohio
Inland Steel Co., Chicago, Ill.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Ryerson & Sons, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Roofing—Tin

Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Taylor Co., N. & G., Philadelphia, Pa.

Rubbish Burners

Hart & Cooley Co., New Britain, Conn.

Schools—Sheet Metal Pattern Drafting

St. Louis Technical Institute, St. Louis, Mo.

Schools—Warm Air Heating

St. Louis Technical Institute, St. Louis, Mo.

Screws—Hardened Metallic Drive

Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Parker-Kalon Corp., 200 Varick St., New York

Screws—Hardened Self-Tapping, Sheet Metal

Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Parker-Kalon Corp., 200 Varick St., New York

Screens—Perforated Metal

Harrington & King Perforating Co., Chicago, Ill.

Shears—Hand and Power

Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
Viking Shear Co., Erie, Pa.

Sheet Metal Screws—Hardened, Self-Tapping

Parker-Kalon Corp., 200 Varick St., New York

Sheets—Alloy

Central Alloy Division, Republic Steel Corp., Youngstown, Ohio
International Nickel Co., New York, N. Y.

Sheets—Black and Galvanized

American Rolling Mill Co., Middletown, Ohio
Central Alloy Division, Republic Steel Corp., Youngstown, Ohio
Eller Mfg. Co., Canton, Ohio
Inland Steel Co., Chicago, Ill.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
National Association of Flat Rolled Steel Manufacturers, Cleveland, Ohio
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Rockford Sheet Steel Co., Rockford, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
Taylor Co., N. & G., Philadelphia, Pa.

Sheets—Iron

American Rolling Mill Co., Middletown, Ohio
Central Alloy Division, Republic Steel Corp., Youngstown, Ohio
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Sheets—Tin

Taylor Co., N. & G., Philadelphia, Pa.

Shingles and Tiles—Metal

Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Sifters—Ash

Diener Mfg. Co., G. W., Chicago, Ill.

Sky Lights

Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Snips

Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Solder—Acid Core

Kester Solder Co., Chicago, Ill.

Solder—Self-Fluxing

Kester Solder Co., Chicago, Ill.

Solder—Rosin Core

Kester Solder Co., Chicago, Ill.

Solder

Eller Mfg. Co., Canton, Ohio
Kester Solder Co., Chicago, Ill.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Soldering Coppers

Revere Copper & Brass, Rome, N. Y.

Soldering Furnaces

Diener Mfg. Co., G. W., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Specialties—Hardware

Diener Mfg. Co., G. W., Chicago, Ill.

Stars—Hard Iron Cleaning

Fanner Mfg. Co., Cleveland, Ohio

Statuary

Miller & Doing, Inc., Brooklyn, N. Y.

Stove Pipe Reducers

Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Tinplate

Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Taylor Co., N. & G., Philadelphia, Pa.

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Bertsch & Co., Cambridge City, Ind.
Dries & Krump Mfg. Co., Chicago, Ill.
Hyro Mfg. Co., New York, N. Y.
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Osborn Co., The J. M. & L. A., Cleveland, Ohio
Rockford Sheet Steel Co., Rockford, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
Viking Shear Co., Erie, Pa.
Whitney Mfg. Co., W. A., Rockford, Ill.

Torches

Diener Mfg. Co., G. W., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Trade Extension

Copper & Brass Research Association
National Association of Flat Rolled Steel Manufacturers, Cleveland, Ohio
Sheet Steel Trade Extension Committee, Cleveland, Ohio

Trimmings—Stove and Furnace

Fanner Mfg. Co., Cleveland, Ohio

Vacuum Cleaner—Furnace

Brillion Furnace Co., Brillion, Wis.
National Super Service Co., Toledo, Ohio

Ventilators

Aeolus Dickinson Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Ventilators—Ceiling

Hart & Cooley Co., New Britain, Conn.
Henry Furnace & Fdy. Co., Cleveland, Ohio

Wood Faces—Warm Air

Auer Register Co., Cleveland, Ohio
American Wood Register Co., Plymouth, Ind.
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

This machine saves time and money—it does all your cutting—takes sheets of any width—cuts curves in any direction and does it accurately—

MARSHALLTOWN
Rotary Throatless Shears

Only Three Moving Parts

A Powerful Durable and Speedy Machine

Sizes for Cutting Up to ½ inch

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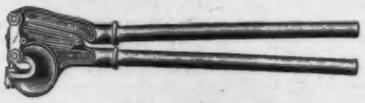
Durably made for Speedy and Accurate Punching



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Here's the punch for tough work. Weight 22 pounds, well distributed to correctly balance the tool. Capacity ⅜ inch hole through ¼ inch iron. Heavily reinforced for strains. Punches and dies in 14 sizes from 5/32 to 9/16 by 1/32 inch. Insertable pipe handles.

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And this is the punch that made the Whitney Line famous. Length 23 inches. Weight 13 pounds. Depth of throat, 1 11/16 inch. Capacity, 5/16 inch through ¼ inch iron or equivalent. Extra punches and dies in 13 stock sizes, ⅛ to ½ inch by 1/32 inch. Also made in 64ths special.

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Established *1908*

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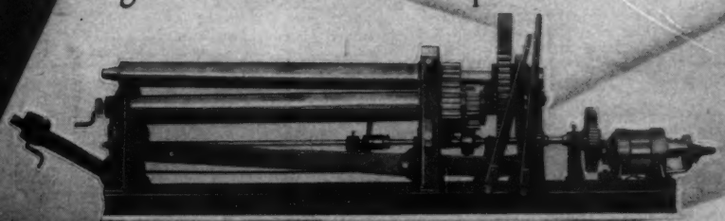
Capacities-Lightest sheet to heaviest plate



Our Line
Light and heavy machinery for all classes of sheet metal, plate and structural work

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Cambridge City Indiana

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SHEET METAL
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Wise Furnace Co.* —

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WANTS AND SALES

Yearly subscribers to the AMERICAN ARTISAN may insert advertisements of not more than fifty words in our Want and Sales Columns WITHOUT CHARGE for three insertions.

Such advertisements, however, must be limited to help or situation wanted, tools or equipment for sale, to exchange or to buy, business for sale or location desired, and must reach our office ten days prior to date of publication. This privilege is not extended to manufacturers or jobbers—or those making a business of buying and selling used machines—employment agencies and brokers.

When sending advertisement state whether your name or blind number is to be used.

BUSINESS CHANCES

Partner Wanted—I am looking for a good, honest man who is willing to work with me, pull together and help me make money in the sheet metal and furnace business. The hardware people with whom I am now associated are willing to sell out but I haven't enough capital. Would require about $2,000.00. It means an investment of $2,000 for half interest I am a hard worker, and partner must be willing to work as I do, taking the same privileges. Address S-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Lightning Rods—Dealers who are selling Lightning Protection will make money by writing to us for our latest Factory to Dealer Prices. We employ no salesmen and save you all overhead charges. Our Pure Copper Cable and Fixtures are endorsed by the National Board of Fire Underwriters and hundreds of dealers. Write today for samples and prices. L. K. Diddie Company, Marshfield, Wis.

Sheet metal, jobbing and manufacturing shop for sale. In successful operation for 20 years. Ninety miles south of Chicago. Lot, building, stock and tools well worth $2,500. Selling on account of age and ill health. Will take less for immediate sale. Address H. W. Darrow, Winamac, Ind. J-521

Wanted to Buy—Small sheet metal shop in Kansas or Oklahoma, or go in as working partner. Can furnish best of references. Address R-521. AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale—Combination tin and plumbing shop in one of the best little towns in Nebraska. Other business to occupy my time, reason for selling. Address R-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

SITUATION WANTED

Position Wanted — An experienced heating man competent to take complete charge of your warm air heating department handling sales, collections as well as superintending installations, seeks an opportunity where compensation depends on ability and success. Age 35, married with family. Honest, a hard worker, a successful record of accomplishments, can produce A-1 references. Now employed in Central Illinois and willing to move wherever a real opportunity exists. Address A-522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Position Wanted—By young man experienced in ventilation, furnace and general sheet metal work. Good layout man and draftsman. Steady work more essential than high wages. Address Carl Slater, 2214 7½ St. So., Minneapolis, Minn. B-521

SITUATION WANTED

Sheet metal mechanic, 21 years' experience in ventilating, skylight, cornice, furnace, restaurant and general sheet metal work, desires position. Capable of taking any sized job and completing same according to specifications. Experienced foreman and estimator. Can furnish reference from all former employers. Married, sober, reliable and anxious to connect with firm where there is a future. Employed but wish to make change. Address X-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

First class sheet metal worker and furnace man desires position west of the Mississippi, preferably southwest. Understands Standard Code installations from both engineering and installation viewpoint. Can cut most patterns, lay slate, and some knowledge of plumbing, fender and body work. Like to hook up with furnace concern in engineering department; 18 years' general experience. Address G-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By superintendent who understands estimating, costs, production, designing, engineering and marketing in the various branches of the metal industry, comprising metal specialties, metal stamping, tanks, structural steel, heating and ventilating, etc. Twenty years' experience with one firm in executive capacity; 44 years of age and married. Address C-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By first class tinner and sheet metal worker at all branches of the trade, including heating and ventilating, furnace, all outside work; also dairy, hotel and kitchen equipment. Steady, reliable; best of reference as to ability as mechanic and taking charge of men and producing results. Forty-eight years of age and in good health. Address J-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—Furnace man and sheet metal worker. Can estimate, layout and sell jobs. Have had some plumbing, hot water and steam experience. Have worked at the trade twenty-five years. Married and strictly sober. Can come at once. Address Y-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By all around sheet metal worker. Can handle any branch of the trade such as cornice, skylight, ventilation and hot air heating. Can also make estimates and take care of shop. Middle aged, sober and steady. Will go anywhere. Address C-522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By experienced sheet metal salesman. Twenty-three years' traveling experience in the line. Well acquainted with sheet metal and furnace dealers in Iowa. Reference and bond furnished Iowa territory. Can begin work at once. Address Z-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—Thoroughly reliable experienced heating man and salesman for furnaces, fittings and good installations. 20 years' experience in the furnace heating game. Clean record, references and car. Illinois or Ohio preferred. Address E-522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Position Wanted—By all-round sheet metal worker. Have had experience in all lines of work, either at bench or outside. Can estimate draft patterns and take charge of anything in the business. Illinois or Indiana preferred. Address A-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—Combination sheet metal, furnace and hardware man. Over 20 years' experience. Live, active and reliable. Can lay out and handle all types of sheet metal work. Prefer live country town. Sober, reliable and married. Address H-518, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By combination sheet metal, plumbing and heating man. Will take straight plumbing or sheet metal job. Very good on warm air heating. Forty years of age, 18 years at the trade and will go anywhere. Address T-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

SITUATION WANTED

Situation Wanted—Sheet metal worker, thoroughly experienced in pattern drafting, ventilating, blowpipe and general furnace work, desires position in or near Chicago. 20 years' experience. Young, industrious, sober, reliable family man. Desire steady job. Address K-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By experienced young single man in hardware or grocery store. Can do bookkeeping. Address W-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Position Wanted—By a real furnace man, tinner, roofer, estimator and producer. Wages reasonable. Address D-519, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted — By licensed master plumber, steam and hot water fitter, 16 years of experience in estimating the above work. Have $1,000 to invest in good paying shop. Can furnish best of references as to ability and honesty. Address L-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By all around sheet metal worker and furnace man. Want a year around job. Will connect with shop where owner wants to sell out or retire next year. Habits and health o.k. Midwestern states preferred. Address Z-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By first class sheet metal worker, plumber and warm air furnace man. Would like position in connection with hardware store. Iowa or Illinois preferred. Address S-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By experienced tinner and warm air furnace installer. Good on gutters and all outside work. Sober and steady workman. Years of experience in hardware and tin shop. Address Y-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By good reliable sheet metal man. Experienced in warm air heating; 18 years at the business and would like to locate in one-man shop in small town. Address H. E. Laurence, 3703 Meldrum, Detroit, Mich. P-520

Situation Wanted—Licensed plumber, steam fitter, warm air heating, tinsmith, wants position in small town only. Thoroughly practical. Wages to suit. Address Jess Wildrick, Gen. Del., Detroit, Mich. M-520

Position Wanted—Heating, ventilating, blowpiping or mill work. Twenty-two years at the trade. Best of reference on sheet metal work. Address B-522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By all around sheet metal worker. Can handle any branch of the trade such as cornice, skylights, ventilation and hot air heating. Address T. W. Babb, 112 East Fourteenth St., Wichita, Kansas. D-522

HELP WANTED

Wanted—A first class sheet metal worker, capable of doing all kinds of shop work. Must be practical shop man and thoroughly competent to turn out neat and good work. Address D-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Wanted—Layout man and sheet metal workers with hollow metal door and trim experience. Address E-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Wanted—Combination Plumber and Sheet Metal Worker. Must be neat, clean and sober. State wages wanted in first letter. Address O-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

TOOLS AND MACHINES

For Sale—1 No. 737 Pexto Notching Machine complete with stand. 1 No. 653 Pexto 21" Double Seaming Machine with stand. The above in excellent condition, very slightly used. Like new. Write for prices. Address T-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale—No. 26 Beaver Rachet Die, with extra set of dies, good as new, at $10. No. 502 Pexto Grooving Machine at $15. Heavy Beading Machine, capacity 20 gauge, at $15. Address G. W. Meisenhoelder, Parkston, S. D. D-520

Wanted—To buy the following used machinery: 1—four, five or six foot ¼ in. or 5/16 in. capacity brake and 1—four, five or six foot ¼ in. or 5/16 in. capacity rolls (power preferred). Address Baker Furnace Co., 2505 Albion St., Toledo, Ohio. G-521

For Sale—One Marshalltown throatless shear, brand new. One set 24-in. forming rolls. One grooving machine. One roof double seamer and two pairs of tongs for same. Will take $50 for the lot. Shears alone cost $40. Address B-520, AMERICAN ARTISAN, 139 N. Clark St.

For Sale—One power adjustable machine for making galvanized rolled roofing and valley tin. In good condition and price is right. Address W-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale—One set of bench machines and stands, also stakes of all kinds. Fair to good condition. Will make very low price on one or all. Address J. R. Hopkins, 820 E. 12th St., Pueblo, Colo. H-521

For Sale—Hardware fixtures and tools. Only hardware in town of 700. Address R. H. Lowe, Mt. Vernon, Iowa. F-521

Wanted—Attention, manufacturers: We wish to buy a number of small tinners' hand punches, capacity 24 gauge. Address G. S. Meisenhoelder, Parkston, S. D. E-520

Wanted to Buy—Used power pipe threading machine, size ½- to 2-in. State price and give name and condition of machine. Address John O. Olson, Humboldt, Iowa. C-520

Wanted—One 30-in. forming machine, one 8- or 10-ft. brake, guaranteed not to be sprung. Address Schwarzkopf Sheet Metal Works, Waupaca, Wis. F-520

Wanted to Buy—30" bar folder and 30" squaring shears. Address Kerstens Tin Shop, 1511 North 8th St., Sheboygan, Wis. X-521

MISCELLANEOUS

For Sale—Hot Water Heating system. Installed four years. 4-22 W Arco Boiler, Four American Radiator Co., peerless plan radiators, Thrush System. Six sets of Crane Packless Valves, Basement Expansion Tank, pipe, fittings and pipe covering. All in A-1 condition. Will sell all or any part of it. Address Moser Brothers, Sabetha, Kansas. P-521

BOOKS

The best $10.00 investment you can make—buy a copy of Standard Practice in Sheet Metal Work, the National Sheet Metal Contractors Association big book. See display advertisement in this issue. Order from AMERICAN ARTISAN, 139 North Clark Street, Chicago, Ill.

BOOKS

The Revised Edition of the New Metal Worker Pattern Book by Kittridge and Associates is one book that should be in every shop. As a reference book alone it is indispensible. Over 500 9x11-inch pages with 895 illustrations. It covers the principles underlying practically every problem that is likely to come up in daily practice. Beginning with the selection and use of drawing tools, the author explains linear and geometrical drawing so clearly that one who has had nop revious knowledge of arithmetic or drawing may understand these essentials and apply them. The most approved methods of pattern cutting are also given in the course of the work... Price, $6.00, postpaid. Order from the Book Dept., AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Skylight and Roof Tables—Very handy, giving complete set of tables showing the actual length of common jack and hip bars for all ordinary pitches of skylight, graduated by inches and covering every possible size from 2 feet to 30 feet in width and pitches of from ¼ inch to 24 inches in one foot. A big timesaver. 84 pages; bond paper; handy pocket size. Cloth bound. Price $1.00. Order from Book Department, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

SPECIAL NOTICES

The Rate for Special Notices —displayed want ads—

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When sending copy, state whether your name or blind number is to be used—also how many insertions are desired.

PATENTS

HUBERT E. PECK
Patent Attorney
Barrister Bldg., WASHINGTON, D. C.

WANTED

Salesmen calling on furnace dealers to sell KLEENAIRE Furnace Filters as side line. Write KLEENAIRE Filter Co., Stevens Point, Wis. Z-519

WANTED—FURNACE SALESMAN

For Iowa. One who knows the furnace business; can make plans and estimate jobs in accordance with the Standard Code. Must have a clean, successful record. Give qualifications and past connections for five years in first letter. This is a real proposition for a man who can qualify. Address A-520, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

WANTED

First class sheet metal worker, dependable, steady and sober. No drinker need apply. Need man at once. Address K-521, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

SPECIAL NOTICES

DEPARTMENT HEADS AND SALESMEN

By a large department store chain for plumbing, heating, hardware and paint department. Permanent position, with opportunities for advancement, for men who are qualified by experience to plan and figure plumbing, heating and furnace jobs and have complete knowledge of the operation of a hardware department.

All replies must be complete as to experience, age, past and present salary. Address O-521, American Artisan, 139 N. Clark St., Chicago, Ill.

SPECIAL NOTICE TRAVELING MEN AND DEALERS

I want to get in touch with a few salesmen and dealers who take Saturday afternoon off. I want to buy that time and your ability to sell Heat. To those who can qualify I'll pay a full day's salary for a half day's work at the rate of $7,000.00 a year.

I am not connected with either the Warm Air or Sheet Metal Industry — so write in confidence. Address Opportunity, L-521, American Artisan, 139 N. Clark St., Chicago, Illinois.

SALESMAN

Wisconsin, also Indiana, who sells furnace trade, job FURNACE DUST ELIMINATORS sideline, ready sales, good commission.

DUSTLESS ASH COMPANY
Muskegon, Mich.

VIKING SHEAR

Compound LEVER Handle—Removable Blades

A child can work them

VIKING SHEAR CO., Erie, Pa.

Undeniable progress

Barnes

Barnes Super Miter

THE most rigid miter ever made. Designed in two pieces which are joined together by a lock seam. The Barnes clip—an exclusive feature, is rigidly secured where the beaded edges meet. Accurate right angle and adequate bead insure easy assembly on the job.

Use Barnes Products to Build Better Business

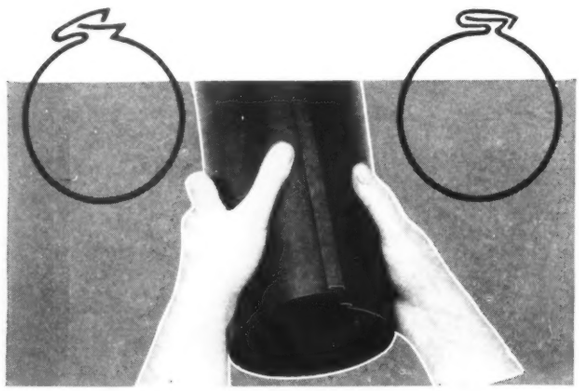
BARNES METAL PRODUCTS COMPANY

4425 W. 16TH STREET CHICAGO, ILLINOIS

MANUFACTURERS OF CONDUCTOR PIPE, ELBOWS, EAVES TROUGH AND FITTINGS. ALL SIZES, ALL METALS

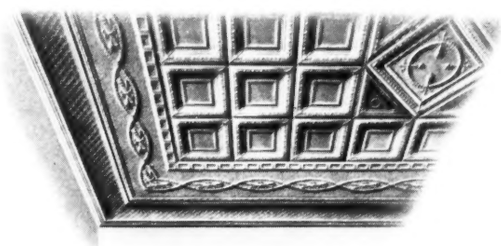
SELFLOCK the quickest Stove pipe to Assemble . . . easiest to Install . . .

Snap the joint . . . and it's locked to stay. Doubly sealed to prevent smoke from escaping. No tools . . . no rivets . . . no hammering. The seam is on the outside. You can ***see*** that the joint is perfect from end to end. Write for prices and samples.



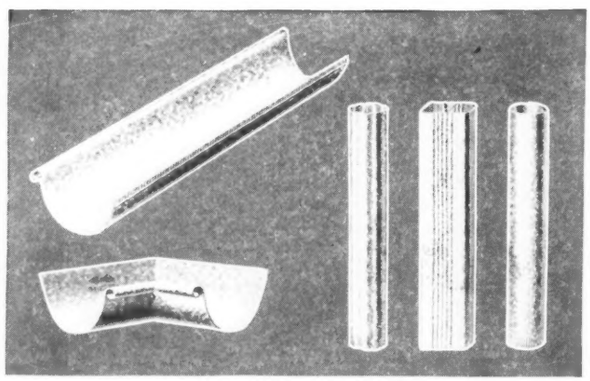
SELL MILCOR Ceilings to Merchants Near You

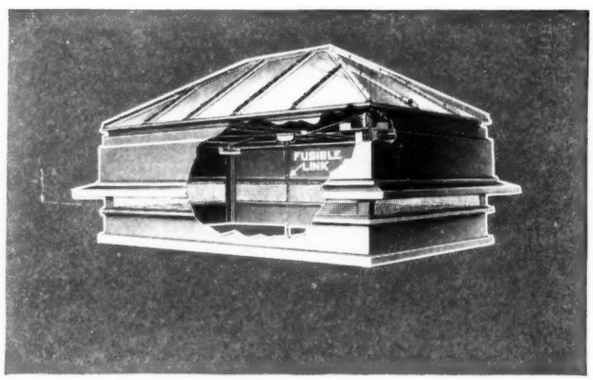
Every store that needs re-decorating . . . and many churches and schools . . . are prospects for *Milcor* Metal Ceilings. Hundreds of attractive and appropriate designs to choose from . . and *Milcor* Service Department will gladly help you estimate your costs to get the job at a profit. Write for illustrated Metal Ceiling catalog and complete information.



MILWAUKEE CORRUGATING COMPANY, 1417 *Burnham St., Milwaukee, Wis.*
Branches: Chicago, Ill., Kansas City, Mo., La Crosse, Wis.
Sales Offices: Boston, Mass., New York, N. Y., Atlanta, Ga., Little Rock, Ark., Minneapolis, Minn.
Eastern Plant: **THE ELLER MANUFACTURING CO.,** ***Canton, Ohio***

MILCOR PRODUCTS





"Same Day" Shipments on the MILCOR Line . . .

On rain carrying equipment as well as other sheet metal products *Milcor* makes "same day" shipments...enabling you to do the greatest business with the least amount of money tied up. If you do not have a copy of the *Milcor* Sheet Metal Hand Book, send for a copy ***now.*** You can do better when you deal with *Milcor.*

MILCOR Skylights to Meet Every Need . . . . .

You can buy skylights from *Milcor* and make more money on the sale than manufacturing them yourself. Every combination you can ever need is in the *Milcor* line. Ventilators of all kinds . . . all made up to highest standards of materials and workmanship. Quick shipment from stock is another feature of *Milcor* service of definite value to you.